

ALUM CREEK LAKE OHIO

MASTER PLAN UPDATE PROGRAMMATIC ENVIRONMENTAL ASSESSMENT



August 2011 Draft



**US Army Corps
of Engineers**
Huntington District
Huntington, West Virginia

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Appendix A: Alum Creek Lake Master Plan Update

Appendix B: Project Correspondence and Agency Coordination

Appendix C: Notification of Availability of Draft Alum Creek Lake Programmatic
Environmental Assessment

List of Acronyms

BLM	Bureau of Land Management
BMP	Best Management Practice
Del-Co	Delaware County Water Company, Inc.
EM	Engineering Manual
EO	Executive Order
ERGO	Environmental Review Guide for Operations
GIS	Geographic Information System
HPMP	Historic Properties Management Plan
NEPA	National Environmental Policy Act
NGVD	National Geodetic Vertical Datum
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
MPU	Master Plan and Master Plan Update
NAAQS	National Ambient Air Quality Standards
NWI	National Wetlands Inventory
ODNR	Ohio Department of Natural Resources
OMP	Operational Management Plan
PEA	Programmatic Environmental Assessment
RUO	Resource Use Objective
TMDL	Total Maximum Daily Load
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service

1.0 INTRODUCTION

1.1 Scope of the Programmatic Environmental Assessment

The United States Army Corps of Engineers (USACE) periodically updates master plans for its projects to support each site's authorized purposes. The previous Master Plan Update for Alum Creek Lake, prepared in April 1984, has been updated in 2011 to include recommendations for improvements to support the authorized purposes of flood risk management, recreation, water supply, and fish and wildlife management. This Programmatic Environmental Assessment (PEA) is intended to provide a broad evaluation of the potential environmental consequences of the program of improvements proposed by the USACE (the Proposed Action), as well as the consequences of not proceeding with this program (the No Action Alternative). The PEA has been prepared in coordination with Federal and State of Ohio (OH) resource agencies to satisfy the requirements of the National Environmental Policy Act (NEPA) of 1969 (42 United States Code [USC] §§ 4321- 4327) and other applicable regulatory requirements. The PEA will also assist USACE decision-makers in implementing the recommended measures identified in the 2011 Master Plan Update. In the future, after design details and specifications are developed for specific actions authorized by provisions of an Operational Management Plan (OMP), Design Memoranda, or other planning procedures, additional supplementary environmental documentation will be prepared as needed. Depending on the nature of expected impacts resulting from individual or a combination of improvements, this documentation may take the form of measure-specific environmental assessments or categorical exclusions, as determined necessary for compliance with Federal and State laws and regulations.

1.2 Project Background

Alum Creek Lake (hereafter referred to as the Project) is located in Delaware County, Ohio on Alum Creek, a tributary of Big Walnut Creek in the Scioto River Basin. Figure 1-1 shows the location of the Project, as well as major highways in the Project area. The Project consists of approximately 8,400 acres owned by the USACE, which are either managed by the USACE or leased or licensed and managed by another entity (with USACE oversight) as an outgrant. An outgrant is a written interest granted to an individual, organization, or agency allowing use of government property. The instrument conveying the interest typically contains conditions and restrictions on the use of the property. The managing entities of an outgrant must comply with all applicable restrictions and requirements of the Master Plan Update and USACE regulations. The primary recreation and outgrant areas, acreages, existing amenities, and managing entities are listed in Table 1-1 and shown in Figure 1-2. The Ohio Department of Natural Resources (ODNR) is the largest holder of an outgrant in the Project.

Table 1-1: Federal Recreation Areas and Major Outgrant Areas

Name of Area	Acreage	Managing Agency	Major Facility/Activities
Visitor Center/Office Area	7	USACE	Hiking, exhibits, interpretive area
Dam Site	36.94	USACE	Operational structures, physical fitness activities
Below Dam Recreation Area	35	USACE	Picnicking, fishing
Alum Creek State Park	8,017	ODNR	Boating, picnicking, fishing, hunting, camping, horseback riding, hiking, biking
Model Airplane Field	9.5	Westerville Model Aeronautics Association (WMAA)	Model airplane flying, picnicking
Del-Co Water Company	4.5	Del-Co Water Company	Water treatment plant
City of Columbus	0.6	City of Columbus	Pump station

The original Alum Creek Lake Preliminary Master Plan was approved in March 1967 as Design Memorandum 3A. The Master Plan was subsequently updated in 1968 and 1970 as Design Memoranda 3B and 3C, respectively. The last update was approved in April 1984 as Design Memorandum 13. This PEA addresses the broad program-level impacts of the 2011 Master Plan Update. The 2011 Master Plan Update is presented in Appendix A of this PEA.

1.3 Project Authorization

The Alum Creek Lake Project was authorized for construction by the Flood Control Act of 1962, H.R. 13273, Public Law (PL) 87-874, which was passed by the 87th Congress on October 23, 1962.

1.4 Project Purpose and Need

The purpose of the 2011 Master Plan Update is to provide guidance for the preservation, conservation, restoration, maintenance, management, and development of Project lands, waters, and associated resources. The Master Plan Update is intended to aid responsible stewardship of Project resources for the benefit of present and future generations.

The Master Plan Update evaluates the present use and future potential of Project resources and recommends strategies for the future management and development of Project resources. Because the Master Plan Update is conceptual in nature, it identifies conceptual types and levels of activities, not designs and exact locations.

The Master Plan Update is based on responses to regional and local needs, resource capabilities and suitability, and expressed public interests that are consistent with authorized Project purposes and pertinent legislation and regulations. The Master Plan Update provides a USACE District-level policy consistent with national objectives and other State and regional goals and programs. Future actions by the USACE and by the agencies and individuals granted leases or licenses for use of Project lands must be consistent with the Master Plan Update. The Master Plan Update is distinct from the project-level implementation emphasis of the OMP. Policies in the Master Plan Update are guidelines that will be implemented through provisions of the OMP, specific design memoranda, and other planning mechanisms.

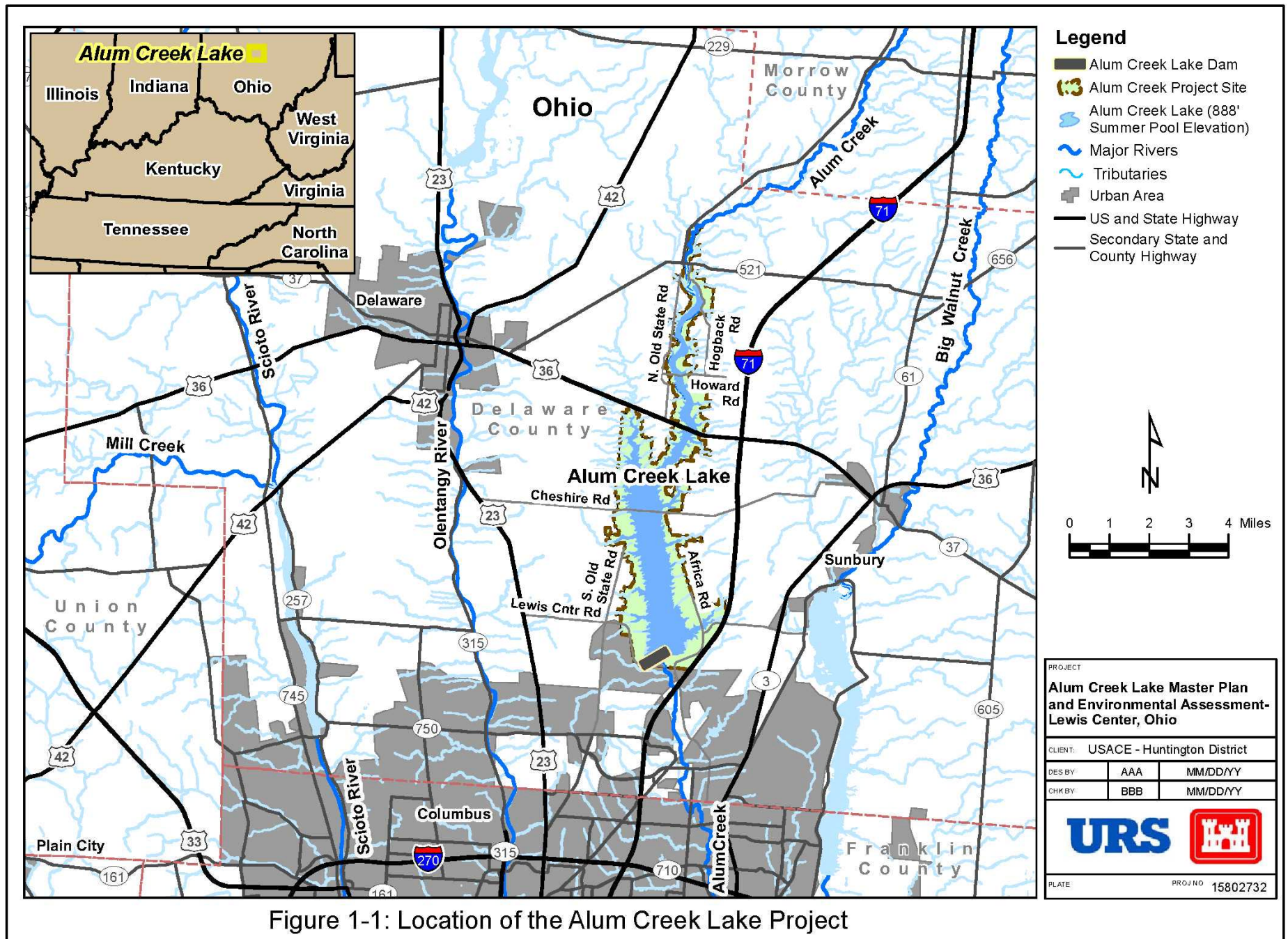
The broad intent of the Master Plan Update is to:

- Determine appropriate uses and levels of development for Project resources;
- Provide a framework within which the OMP and other planning mechanisms can be developed and implemented; and
- Establish a basis on which outgrants and recreational development proposals can be evaluated.

The purpose of this PEA is to evaluate, on a broad level, the impacts of the recommended resource plan measures proposed in the 2011 Alum Creek Lake Master Plan Update. Master plans are periodically updated to maintain focus on three primary components: Regional and ecosystem needs, resource capabilities and sustainability, and public interests and desires. An updated Master Plan is essential in fostering efficient and cost-effective projects for natural resources, cultural resource management, and recreational programs by ensuring that current environmental mandates and considerations are taken into account as part of project planning (U.S. Army Corps of Engineers, 1996a). Additionally, the Master Plan Update describes specific recommendations (e.g., boat slips, picnic tables, and informational signage) to accommodate increased or new demands that may affect project resources in the future.

The 2011 Master Plan Update addresses the resources and issues in the Project area, consisting of, but not limited to: Fish, wildlife, vegetation, cultural, aesthetic, interpretive, recreational, mineral, commercial, outgrant lands, easements, and water. Through the implementation of an updated Master Plan, the USACE can provide responsible and timely protection, conservation, and enhancement of Project resources. The PEA is needed to assist the USACE in their decision-making process regarding implementation of the Master Plan Update measures and to comply with NEPA and other applicable laws and regulations.

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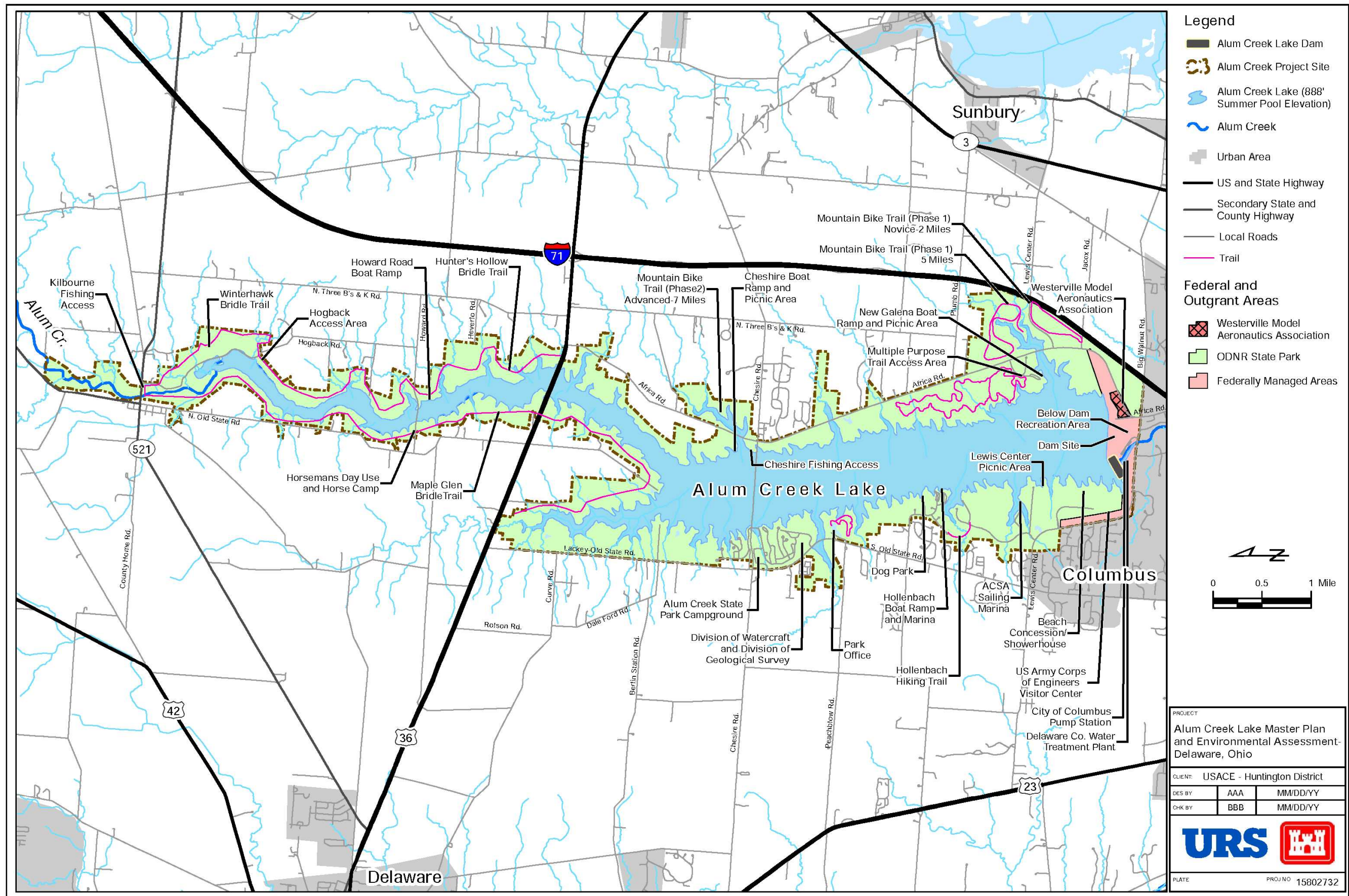


Figure 1-2: Recreational Areas and Outgrants in the Alum Creek Lake Project

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2.0 NO ACTION AND PROPOSED ACTION ALTERNATIVES

2.1 No Action Alternative

Under the No Action Alternative, no new actions outlined in the 2011 Master Plan Update would be undertaken. Operation and management of Alum Creek Lake would continue as described in the 1984 Master Plan Update. Existing facility maintenance, erosion control, flood risk management, and management of recreation areas and activities would continue. In addition, new facilities and/or activities not identified in the 1984 Master Plan Update may be constructed or implemented on a case-by-case basis.

2.2 Proposed Action

The Proposed Action consists of the measures and actions that are listed in Table 2-1. The Proposed Action would address the projected demands that are identified in the Master Plan Update. More information about the elements of the Proposed Action is provided in Section 7.0 (Resource Plan) of the Alum Creek Lake Project Master Plan Update, included as Appendix A to this PEA. Full implementation of the Master Plan Update would allow updated management and development of the Project lands and waters, thus reflecting environmental stewardship and conservation best management practices while meeting current and future public, social, and economic demands.

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Table 2-1: Resource Plan for the Alum Creek Lake Project

Project Area	Land Classification	Management Agency	Issue	Recommendations
Visitor Center	Project Operations	USACE	No issues were identified for this area.	<ul style="list-style-type: none">Periodically update exhibits.
Below Dam Recreation Area	Project Operations	USACE	Neighboring townships are developing multi-use bikeway/pedestrian path plans with the expressed interest of providing direct connectivity to the Project and the Below Dam Recreation Area. Bike and pedestrian access to the Project could help reduce the demand for vehicular parking, as parking is at capacity at several locations throughout the Project (RUO 5) ¹	<ul style="list-style-type: none">Provide bikeway/pedestrian path connections in the Below Dam Recreation Area to improve connectivity to neighboring communities. Potential access locations include Bale Canyon Road and Africa Road.Develop a pedestrian/bicycle bridge over the spillway to provide connectivity between the east and west sides of the spillway, eliminating the need to use Lewis Center Road.Incorporate pedestrian/bikeway trail with the pedestrian bridge between Bale Canyon Road and Jaycox Road.Add parking near the east end of the dam near Africa Road to access the pedestrian/bikeway trail.
			Recreational facilities do not fully meet the needs and demands of visitors. Group picnic shelters are reserved throughout the recreation season and additional demand is forecasted. (RUO 3) ¹	<ul style="list-style-type: none">Provide an additional group picnic shelter and associated parking in the Below Dam Recreation Area.Provide an additional restroom facility and multi-purpose courts.
			The Below Dam Recreation Area has high intensity use and strong demand for fishing during the peak season but does not provide universally accessible fishing access. (RUO 1) ¹	<ul style="list-style-type: none">Integrate a universally accessible fishing pier with the pedestrian/bicycle bridge over the spillway.
			The parking lot on the west side of the spillway is unimproved and at capacity.	<ul style="list-style-type: none">Improve the parking lot on the west side of the spillway area.
			The vehicular entrance to the Below Dam Recreation Area from Lewis Center Road has been noted as a safety concern because of the high traffic volumes on Lewis Center Road. (RUO 5) ¹	<ul style="list-style-type: none">Improve the Below Dam Recreation Area entrance at Lewis Center Road to enhance safety and traffic flow.
			The Winter Recreation Area includes a sledding hill but does not have an ice skating area.	<ul style="list-style-type: none">Provide an ice skating area near the Winter Recreation Area.
Dinneen Field	Recreation (Intensive Use)	Westerville Model Aeronautics Association	Parking facilities at Dinneen Field are over capacity during annual events and on weekends during the peak recreation season. (RUO 3) ¹	<ul style="list-style-type: none">Provide a path from the existing public parking lot located southwest of Dinneen Field, near the Winter Sledding Area, for pedestrian access to the model airplane field.
Alum Creek State Park Campground	Recreation (Intensive Use)	ODNR	The campsites are typically reserved throughout the recreation season and are at capacity, and there are frequent requests for additional cabins. (RUO 2) ¹	<ul style="list-style-type: none">Develop additional RV campsites and construct additional cabins to support current and future demand. Additional RV campsites and cabins could be located adjacent to and north of the existing campground.
			There is an increasing demand and desire for upgraded RV camping facilities and amenities. (RUO2) ¹	<ul style="list-style-type: none">Provide wireless internet service throughout the campground. Wireless internet is an amenity that has been growing in popularity and would be used by a wide variety of visitors.
New Galena Boat Ramps and Picnic Area	Recreation (Intensive Use)	ODNR	There is substantial congestion at the boat ramp during the summer season including weekends, holidays, and fishing tournaments. The site accommodates a high volume of boat launch activity as well as substantial day use activity which results in some conflict of use. (RUO 1) ¹	<ul style="list-style-type: none">Segregate day use from boat ramp traffic.
			Ramp lane widths are obsolete relative to current watercraft usage and size; this effectively reduces launch capacity. The larger vessels using the lake require longer truck/trailer combinations for which current truck/trailer parking spaces are not adequate. (RUO 1) ¹	<ul style="list-style-type: none">Approved plans are currently in place to improve the boat ramp area and associated parking area.
			Turn-a-round areas are inefficient for boat prep prior to launch and securing boats after retrieval. This adds to congestion at boat ramps and blocks access to ramps and parking areas. (RUO 1) ¹	

Table 2-1: Resource Plan for the Alum Creek Lake Project

Project Area	Land Classification	Management Agency	Issue	Recommendations
Lewis Center Picnic Area	Recreation (Intensive Use)	ODNR	No issues were identified within the Lewis Center Picnic Area.	<ul style="list-style-type: none">Maintain existing facilities at this location.
Cheshire Boat Ramp and Picnic Area	Recreation (Intensive Use)	ODNR	There is substantial congestion at the boat ramp during the summer season including weekends, holidays, and fishing tournaments. Also, the site accommodates a high volume of boat launch activity, as well as substantial day use activity, which results in some conflict of use. (RUO 1) ¹	<ul style="list-style-type: none">Segregate day use from boat ramp traffic to the extent possible.
			The boat ramps face directly west toward open lake waters and are exposed to wave action and boat wakes, creating difficulty launching and retrieving boats and causing erosion. Also, ramp lane widths are obsolete relative to current watercraft usage and size; this effectively reduces launch capacity. (RUO 1) ¹	<ul style="list-style-type: none">Re-orient the boat ramp so that boats are launched into the cove. Develop a breakwater to the west of the ramp to protect the boat ramp from wave action and boat wakes.Reconfigured ramps should be designed to accommodate wider boats, consistent with current boat usage and size.
			The larger vessels using the lake (currently up to 32’ in length) require longer truck/trailer combinations for which current truck/trailer parking spaces are not adequate. (RUO 1) ¹	<ul style="list-style-type: none">Develop truck/trailer parking bays adequate to accommodate longer trailers comparable to current boat usage and size.
			Turn-a-round areas are inefficient for boat prep prior to launch and securing boats after retrieval. This adds to congestion at boat ramps and blocks parking areas. (RUO 1) ¹	<ul style="list-style-type: none">Improve the turn-a-round area near the boat ramp to more efficiently accommodate boat prep prior to launch and securing boats after retrieval.
Beach	Recreation (Intensive Use)	ODNR	The existing central beach facility including restrooms, showers, pavilion, and concession area are outdated and do not function effectively. Restroom facilities on the north and south sides of the beach are outdated. (RUO 3) ¹ Due to uncertainty associated with weather conditions, food concession operations have not been successful. (RUO 3) ¹	<ul style="list-style-type: none">Replace central beach facilities, incorporating updated restrooms, appropriate sized shower facilities, pavilion, and concession vending machine area.Restroom facilities on both the north and south side of the Beach Area should be updated.
			The pedestrian path along the beach front dead-ends on the south side of the beach.	<ul style="list-style-type: none">Provide connectivity from the pedestrian path along the beach front to the Visitor Center Trail.
Cheshire Fishing Access	Multiple Resource Management Recreation – Low Density	ODNR	No issues were identified at the Cheshire Fishing Access.	<ul style="list-style-type: none">Maintain existing facilities at this location.
Howard Road Boat Ramp	Multiple Resource Management Recreation – Low Density	ODNR	There is substantial congestion at the boat ramp during the summer season including weekends, holidays, and fishing tournaments. (RUO 1) ¹ There is only one center courtesy dock which impedes the efficiency of this boat ramp. (RUO 1) ¹ Ramp widths are relatively narrow compared to current boat usage and size, which reduces boat launch efficiency. (RUO 1) ¹	<ul style="list-style-type: none">Improve the boat ramp to more efficiently accommodate current boat usage and size including expanding or adding courtesy piers.Provide improved striping and markings to delineate the boat ramp lanes, pre-launch areas, and areas for securing boats after retrieval, as well as procedural signage to increase user awareness and efficiency.
			The larger vessels using the lake (currently up to 32’ in length) require longer truck/trailer combinations for which current truck/trailer parking spaces are not adequate. (RUO 1) ¹	<ul style="list-style-type: none">Develop truck/trailer parking bays adequate to accommodate longer trailers comparable to current boat usage and size.
			Turn-a-round areas are inefficient for boat prep prior to launch and securing boats after retrieval. This adds to congestion at boat ramps by blocking circulation and blocking access to parking areas. (RUO 1) ¹	<ul style="list-style-type: none">Improve the turn-a-round area near the boat ramp to more efficiently accommodate boat prep prior to launch and securing boats after retrieval.
Hogback Road Access Area	Multiple Resource Management Recreation – Low Density	ODNR	Area provides excellent scenic vistas of the lake and wildlife, and also has substantial parking improvements; however, no improvements have been made in the scenic and wildlife viewing area. The area is poorly delineated with signage. (RUO 3) ¹	<ul style="list-style-type: none">Provide entry and directional signage.Provide interpretive signage of the lake and osprey nests.Provide improved access between the parking lot and the viewing area and provide an improved viewing platform with safety railing at the overlook.

Table 2-1: Resource Plan for the Alum Creek Lake Project

Project Area	Land Classification	Management Agency	Issue	Recommendations
Kilbourne Fishing Access	Multiple Resource Management Recreation – Low Density	ODNR	Alum Creek Lake offers limited developed areas for paddle sports. Paddle sports have been identified as the fastest growing component of boating, based on titles issued for boats. (RUO 1) ¹	<ul style="list-style-type: none">Develop a paddle sport area for kayaks and canoes at the Kilbourne Fishing Access Area by providing improved non-motorized boat ramp and access.
			This area currently has parking, gated unimproved access to the shoreline, open space with picnic tables, and restroom facilities. The picnic and restroom facilities are old and in poor condition. (RUO 3) ¹	<ul style="list-style-type: none">Consider developing adjacent picnic sites equipped with tables, grills, and trash receptacles.Update restroom and picnic facilities.
Hunting Areas	Multiple Resource Management Recreation – Low Density	ODNR	High deer population is causing safety problems with vehicular conflicts on surrounding roadways and nuisance feeding on ornamental plants and gardens at surrounding residences. (RUO 4) ¹	<ul style="list-style-type: none">Maintain current hunting opportunities and restrictions to manage the deer population.Develop a wildlife control plan to manage deer population.
Hollenback Marina and Boat Ramps	Recreation (Intensive Use)	ODNR	The boat slips at the marina are 25’ long and many boats utilizing the marina exceed this length. Additionally, the existing breakwater protecting the marina has experienced significant erosion. (RUO 1) ¹	<ul style="list-style-type: none">Upgrade the boat docks at the marina to accommodate vessels up to 32’ long.Reconstruct the breakwater to protect the marina.
			There is currently a waiting list for seasonal boat slip rentals and a lottery is used to assign boat slip rentals. (RUO 1) ¹	<ul style="list-style-type: none">Consider additional seasonal boat slip rentals along with water and electrical service to the dock and supporting facilities including parking and restroom facilities. However, due to current medium to high density boating activity on the lake during recreational season weekends, any recommendation should be supported by a detailed Lake Carrying Capacity analysis to verify that marina expansion will not result in boating activity that exceeds the carrying capacity of the lake.
			High use of the picnic area and shoreline fishing area adjacent to the boat ramp results in passenger vehicles utilizing the adjacent parking areas designed for truck/trailer parking. This also mixes boat launch traffic with day use/shoreline fishing traffic and adds to congestion. (RUO 1) ¹	<ul style="list-style-type: none">Provide separate parking areas to separate day use/shoreline fishing vehicular traffic from boat ramp traffic and the boat trailer parking area.
			There is substantial congestion at the boat ramp during the summer season including weekends, holidays, and fishing tournaments. Also, the ramps are obsolete relative to current boat usage and size; this effectively reduces launch capacity. Turn-a-round areas are inefficient for boat prep prior to launch and securing boats after retrieval. This adds to congestion at boat ramps by blocking circulation and blocking access to parking areas. The larger vessels (currently up to 32’ in length) using the lake require longer truck/trailer combinations for which current truck/trailer parking spaces are not adequate. (RUO 1) ¹	<ul style="list-style-type: none">Approved plans are currently in place to improve the boat ramp area and associated parking area.
Alum Creek Sailing Marina	Recreation (Intensive Use)	ODNR partnership with Alum Creek Sailing Association	There is significant demand for additional boat storage capacity including boat slips, mooring buoys, and dry storage. The marina has been 100% occupied since 2004 and there is a current waiting list for marina boat slips. Available area for marina expansion is limited without encroaching on the designated boaters swim area. (RUO 1) ¹	<ul style="list-style-type: none">Consider providing additional sailboat wet storage by developing a relatively small mooring field of 10 to 20 rentable mooring buoys. However, due to current medium to high density boating activity on the lake during recreational season weekends, any recommendation should be supported by a detailed Lake Carrying Capacity analysis to verify that marina expansion will not result in boating activity that exceeds the carrying capacity of the lake.
			There is no small sailboat launch ramp facility and the current beach storage area for small sailboats is steep. (RUO 1) ¹	<ul style="list-style-type: none">Develop a boat launch near the sailing marina beach to accommodate small sail boats.Provide additional dry storage capacity near the beach and a dry storage area for small sail boats on trailers or small sail boats that can be moved using a mooring dolly.
			Additional space for storage of equipment and dry storage for trailers is needed; there is no office building for the dock manager and file storage. (RUO 1) ¹	<ul style="list-style-type: none">Develop an off-site location for sailboat and trailer dry storage.Develop, on-site, a small office building for the dock manager and file storage; and a storage facility for maintenance equipment.

Table 2-1: Resource Plan for the Alum Creek Lake Project

Project Area	Land Classification	Management Agency	Issue	Recommendations
Friends of Alum Creek Dog Park	Recreation (Intensive Use)	ODNR partnership with Friends of Alum Creek Dog Park	The Alum Creek Dog Park has high use, especially on weekday evenings and weekends during the recreation season. Parking facilities are over capacity, with dog park visitors parking along the street and in grassy areas. (RUO 3) ¹	<ul style="list-style-type: none">• Provide additional parking spaces for dog park visitors in the vicinity of the dog park near the existing restrooms.• Provide an additional entrance to the large dog area near the proposed parking lot expansion.
			The stakeholders of the Alum Creek Dog Park have noted a need for an educational center/group meeting area. (RUO 3) ¹	<ul style="list-style-type: none">• Develop a group shelter with one partial wall, electrical service, lighting, and potable water near the existing restrooms and proposed additional parking area. This facility would be used for educational events concerning pet health, adoption events, and related day use activities.
Mountain Biking Trails	Recreation (Intensive Use)	ODNR partnership with Central Ohio Mountain Biking Organization	Events are typically held at the Phase 1 Trail Head and the parking lot exceeds capacity at times. There is also no potable water or restrooms at the Phase 1 Trail Head. (RUO 3) ¹	<ul style="list-style-type: none">• Improvements at the Phase 1 Trail Head should include expanding parking capacity, adding lighting, restrooms, and potable water.
			Safety concerns have been raised by users regarding traveling between Phase 1 and Phase 2 of the Mountain Bike Trails and not having a dedicated connecting bike trail adjacent to Lewis Center Road and Africa Road. (RUO 3) ¹	<ul style="list-style-type: none">• Coordinate with the county to add separate bike lanes adjacent to Lewis Center Road and Africa Road to provide connectivity between Phase 1 and Phase 2 of the COMBO mountain bike trail systems.
Horseman’s Day Use and Horse Camp Area	Multiple Resource Management (Low Density Recreation)	Ohio Horseman’s Council	The only connectivity on the northern end of the project for the horse trail system between the west side and the east side of the lake is via State Route (SR) 521 and the bridge over Alum Creek. This bridge is relatively narrow with minimal shoulders and creates safety concerns with potential conflicts between vehicles and horseback riders. (RUO 3) ¹	<ul style="list-style-type: none">• Work with ODOT to implement signing, striping, and markings to designate the horse trail connection at the bridge crossing.
Lake	Not Applicable	USACE and ODNR	Shoreline fishing is a popular activity at the Project and there are dedicated areas for shoreline fishing access. Improved catch rates for shore anglers may reduce demand for boat fishing and help alleviate congestion at boat ramps. (RUO 1) ¹	<ul style="list-style-type: none">• Implement fish attractors at dedicated shoreline fishing access locations to benefit shore angler catch rates.
			Boat swim and camp swim activities for boaters are increasing in popularity. (RUO 1) ¹	<ul style="list-style-type: none">• Designate additional coves for boater swim areas and overnight boating activities to accommodate future demand.
Project Wide	Not Applicable	Multiple Agencies	Invasive species are present on site and may potentially threaten existing natural ecosystems. (RUO 4) ¹	<ul style="list-style-type: none">• Implement an invasive species plan to prevent the introduction of invasive species and control and monitor invasive species already present at the Project area in a cost effective and environmentally sound manner.
			The Project area includes unique habitats such as wetlands, habitats that support neo-tropical migratory birds, and bottomland hardwoods. (RUO 4) ¹	<ul style="list-style-type: none">• Conduct a baseline study that identifies unique habitats throughout the Project (e.g., wetlands and bottomland hardwoods) and develop a monitoring program. Knowing the amount and range of the habitats would allow losses or gains to be tracked.
			There is expressed interest and public desire to better connect and link existing and planned pedestrian and bicycle facilities between the surrounding community/neighborhoods and the Project. This could result in reduced vehicular congestion, reduced demand for parking, and reductions in energy and greenhouse gas emissions. Public survey of Orange Township identified trail connectivity to Alum Creek as the #2 need. (RUO 5) ¹	<ul style="list-style-type: none">• Establish improved bikeway and pedestrian connectivity between the Project and surrounding communities. Potential locations for improved connectivity include Bale Canyon Road, Jaycox Road, Africa Road, Cheshire Road, and CR 10.

¹RUO refers to the Resource Use Objective, which is detailed in Chapter 5 of the 2011 Master Plan Update (Appendix A).

3.0 ENVIRONMENTAL SETTING

3.1 Physical Environment

3.1.1 Topography

The Alum Creek Lake Project is located in the Till Plains Section of the Central Lowlands Province of the Scioto River Basin in central Ohio. The topography of the Project is characterized by level plains transitioning to gently rolling terrain with glacial drift mantling the bedrock and filling the preglacial valleys (Ohio Department of Natural Resources, 2005b). Elevations in the Project range from approximately 850 feet National Geodetic Vertical Datum (NGVD) directly below the dam to 920 feet NGVD on the higher slopes at the northern end of the Project area.

The northern portion of the Project to the north of US Highway (US) 36/State Route (SR) 37 has numerous sites with slopes exceeding 30 percent, including along some coves of the lake, although there are a few large tracts of land that have less steep slopes. These areas would have limited development potential based on criteria in USACE *Engineering Manual 1110-1-400*, which recommends avoiding development in areas with slopes exceeding 15 percent (Figure 3-1) (U.S. Army Corps of Engineers, 2004b). Approximately 75 percent of the Project area below US 36/State Route 37 consists of slopes that are less than 15 percent. Areas with slopes less than 15 percent have the highest development potential relative to topography and provide opportunities for higher intensity recreational development, but seasonal inundation in many of these areas may present constraints. Flooding and wet soils are potentially significant constraints in locations with no or minimal slopes, as discussed further in Section 3.1.3. Slopes between 15 percent and 30 percent have more limited project development potential, but can provide interesting and challenging opportunities for hiking, mountain biking, hunting, and wildlife or scenic viewing, as well as other opportunities if properly integrated with site topography.

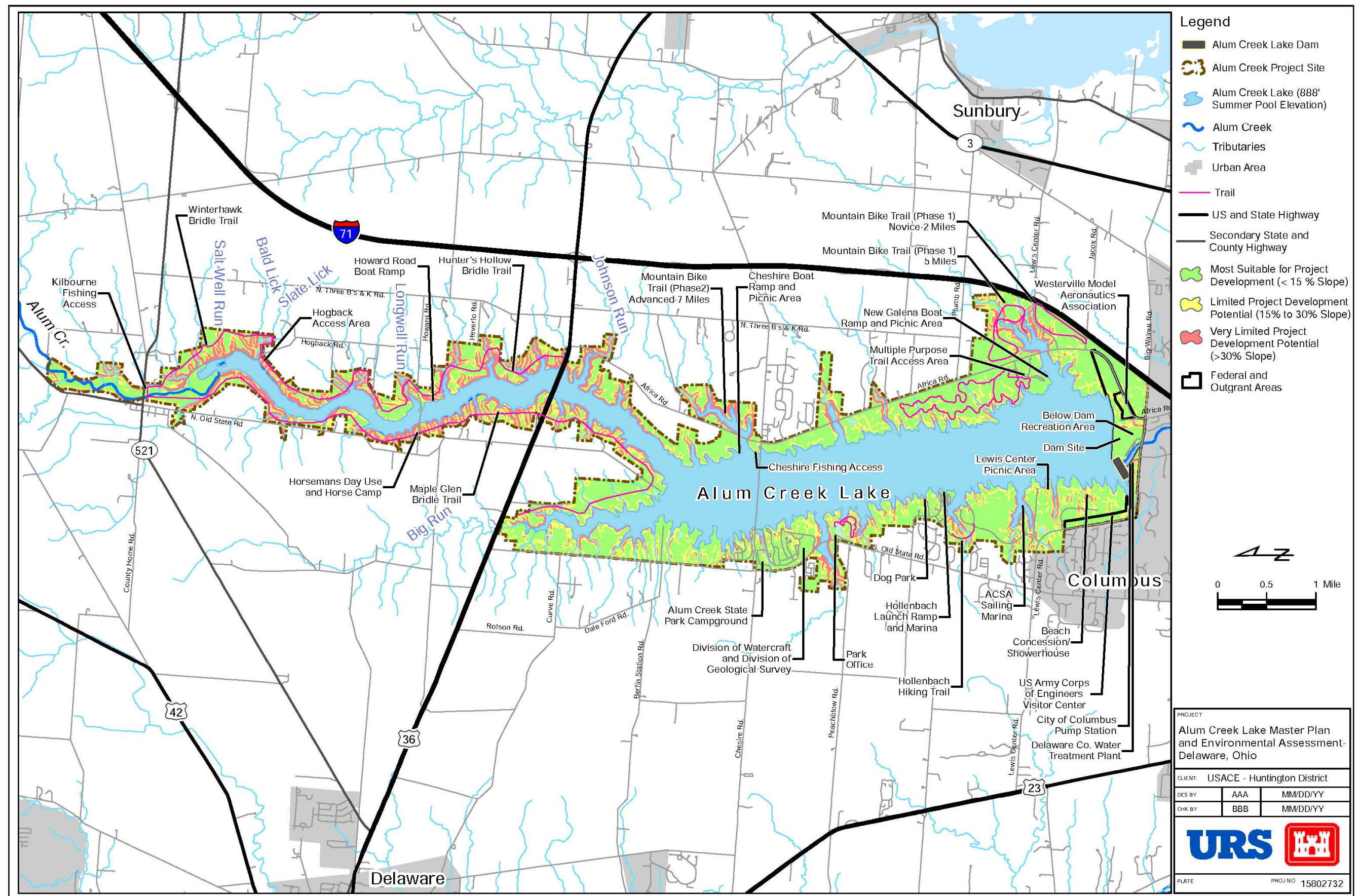
3.1.2 Geology and Mineral Resources

Delaware County, part of the Upper Scioto River Basin, is underlain by sedimentary strata of the Silurian Period, which were created about 350 to 400 million years ago. Surficial deposits consist of glacial drift containing boulders, cobbles, pebbles, sand, silt, and clay and that were deposited when glaciers from the Pleistocene Period melted. There are three primary surficial deposits found in the Project area, which include till, ground moraines, and lacustrine deposits. Till is a particular type of drift made of a compact and heterogeneous mass of unsorted sand, silt, clay, pebbles, cobbles, and a few boulders. Ground moraines are a till-mantled land surface that

is relatively smooth and has little topographic relief. Most of Delaware County consists of ground moraines. Silts and clays that settled out of glacial melt water are classified as lacustrine deposits; these only occur in a few low terraces along Alum Creek. There is no record of any extraction of sand and gravel deposits along Alum Creek. Surveys have indicated that there are no coal deposits on or near the Project. A review of oil and natural gas wells at the Project recorded several abandoned and/or plugged wells within the Project boundary. However, there are no active oil or natural gas wells currently operating within the Project boundary. Figure 3-2 shows the locations of both active and abandoned oil and natural gas wells located in the Project vicinity. The USACE owns all mineral rights within the Project boundary. Since USACE owns all subsurface mineral rights on Project lands, any future resource extraction would proceed through the Bureau of Land Management (BLM). The BLM would coordinate any new leases with the USACE to avoid or minimize impacts to recreational, natural, or sensitive resources associated with access road and extraction site development.

3.1.3 Soils

Fifteen different groupings of soils occur at the Project according to the *2006 Soil Survey of Delaware County, Ohio* (U.S. Department of Agriculture, Natural Resources Conservation Service, 2006). These soil groupings are listed in Table 3-1, which also indicates suitability and limitations of these soil types and slopes for recreational development. Figure 3-3 categorizes the soil types identified in Table 3-1 into three groups: (1) Soils most suitable for development; (2) soils with limited development potential; and (3) soils least suitable for development. Based on the information in Table 3-1, the Cardington, Gallman, Glynwood, and Lobdell soils provide the best opportunity for development because they are the only units classified as “most suitable” or “limited suitability.” These soil units occur in broad areas between the ravines associated with small creeks which flow into Alum Creek Lake. Cardington, Gallman, Glynwood, and Lobdell soils, located primarily along Alum Creek and the lake, are classified as prime or unique agricultural soils (U.S. Department of Agriculture, Natural Resources Conservation Service, 2006).



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Table 3-1: Soils in Order of Predominance in the Project Area

Symbol	Soil Type	Typical Slopes (%)	Suitability Based on Slope and Soil Type
CaB, CaC2	Cardington silt loam	2-12	Limited Project Development Potential. Unsuitable (too wet) for lawn or landscaping; for camping or playground areas; for small buildings; or for septic tank absorption field. Somewhat suitable for picnicking, trails, and golf fairways. Poorly suited for roads due to low strength and frost action.
GwB, GwC2	Glynwood silt loam	2-12	Limited Project Development Potential. Unsuitable (too wet) for lawn or landscaping; for camping, picnicking, or playground areas; for small buildings; or for septic tank absorption field. Somewhat suitable for trails and golf fairways. Poorly suited for roads due to low strength and frost action.
BeA, BeB	Bennington silt loam	0-4	Least Suitable for Project Development. Unsuitable (too wet) for lawn or landscaping; for trails or golf fairways; for camping, picnicking, or playground areas; for small buildings; or for septic tank absorption field. Poorly suited for roads due to low strength, wetness, and frost action.
LbF	Latham-Brecksville complex	25-70	Least Suitable for Project Development. Unsuitable (slope) for lawn or landscaping; for trails or golf fairways; for camping, picnicking, or playground areas; for small buildings; or for septic tank absorption field. Poorly suited for roads due to low strength, wetness, and frost action.
AmD2, AmE, AmF	Amanda silt loam	12-50	Least Suitable for Project Development. Unsuitable (slope) for lawn or landscaping; for trails or golf fairways; for camping, picnicking, or playground areas; for small buildings; or for septic tank absorption field. Poorly suited for roads due to low strength and slope.
LyD2, LyE2	Lybrand silt loam	12-25	Least Suitable for Project Development. Unsuitable (too steep) for lawn or landscaping; for trails or golf fairways; for camping, picnicking, or playground areas; for small buildings; or for septic tank absorption field. Poorly suited for roads due to low strength, slope, and frost action.
SkA, SnA, SoA	Sloan silt loam	0-2	Least Suitable for Project Development. Unsuitable (due to ponding) for lawn or landscaping; for trails or golf fairways; for camping, picnicking, or playground areas; for small buildings; or for septic tank absorption field. Poorly suited for roads due to ponding, flooding, and frost action.
LoA, LsA	Lobdell silt loam	0-2	Limited Project Development Potential. Unsuitable (too wet) for lawn or landscaping; for camping, picnicking, or playground areas; for small buildings; or for septic tank absorption field. Somewhat suited for trails or golf fairways. Poorly suited for roads due to flooding and frost action.

Table 3-1: Soils in Order of Predominance in the Project Area

Symbol	Soil Type	Typical Slopes (%)	Suitability Based on Slope and Soil Type
BoA, BoB	Blount silt loam	0-4	Least Suitable for Project Development. Unsuitable (too wet) for lawn or landscaping; for trails or golf fairways; for camping, picnicking, or playground areas; for small buildings; or for septic tank absorption field. Poorly suited for roads due to low strength, wetness, and frost action.
GaC2, GbA, GbB	Gallman loam, loamy substratum	0-12	Most suited for Project Development. Suitable for lawn or landscaping; for trails or golf fairways; for camping or picnicking; for small buildings; or for septic tank absorption field. Very limited for playground development. Suitable for roads, although there is moderate slope and frost action.
PwA	Pewamo silty clay loam	0-1	Least Suitable for Project Development. Unsuitable (due to ponding) for lawn or landscaping; for trails or golf fairways; for camping, picnicking, or playground areas; for small buildings; or for septic tank absorption field. Poorly suited for roads due to low strength, ponding, and frost action.
CnA	Condit silt loam	0-1	Least Suitable for Project Development. Unsuitable (ponding) for lawn or landscaping; for trails or golf fairways; for camping, picnicking, or playground areas; for small buildings; or for septic tank absorption field. Poorly suited for roads due to low strength, ponding, and frost action.
JmA	Jimtown silt loam	0-2	Least Suitable for Project Development. Unsuitable (too wet) for lawn or landscaping; for trails or golf fairways; for camping, picnicking, or playground areas; for small buildings; or for septic tank absorption field. Poorly suited for roads due to frost action and wetness.
HeF	Heverlo silt loam	25-70	Least Suitable for Project Development. Unsuitable (slope) for lawn or landscaping; for trails or golf fairways; for camping, picnicking, or playground areas; for small buildings; or for septic tank absorption field. Poorly suited for roads due to low strength and slope.
MfA	Millgrove silt loam	0-2	Least Suitable for Project Development. Unsuitable (ponding) for lawn or landscaping; for trails or golf fairways; for camping, picnicking, or playground areas; for small buildings; or for septic tank absorption field. Poorly suited for roads due to ponding and frost action.

Source: U.S. Department of Agriculture, Natural Resources Conservation Service, 2001.

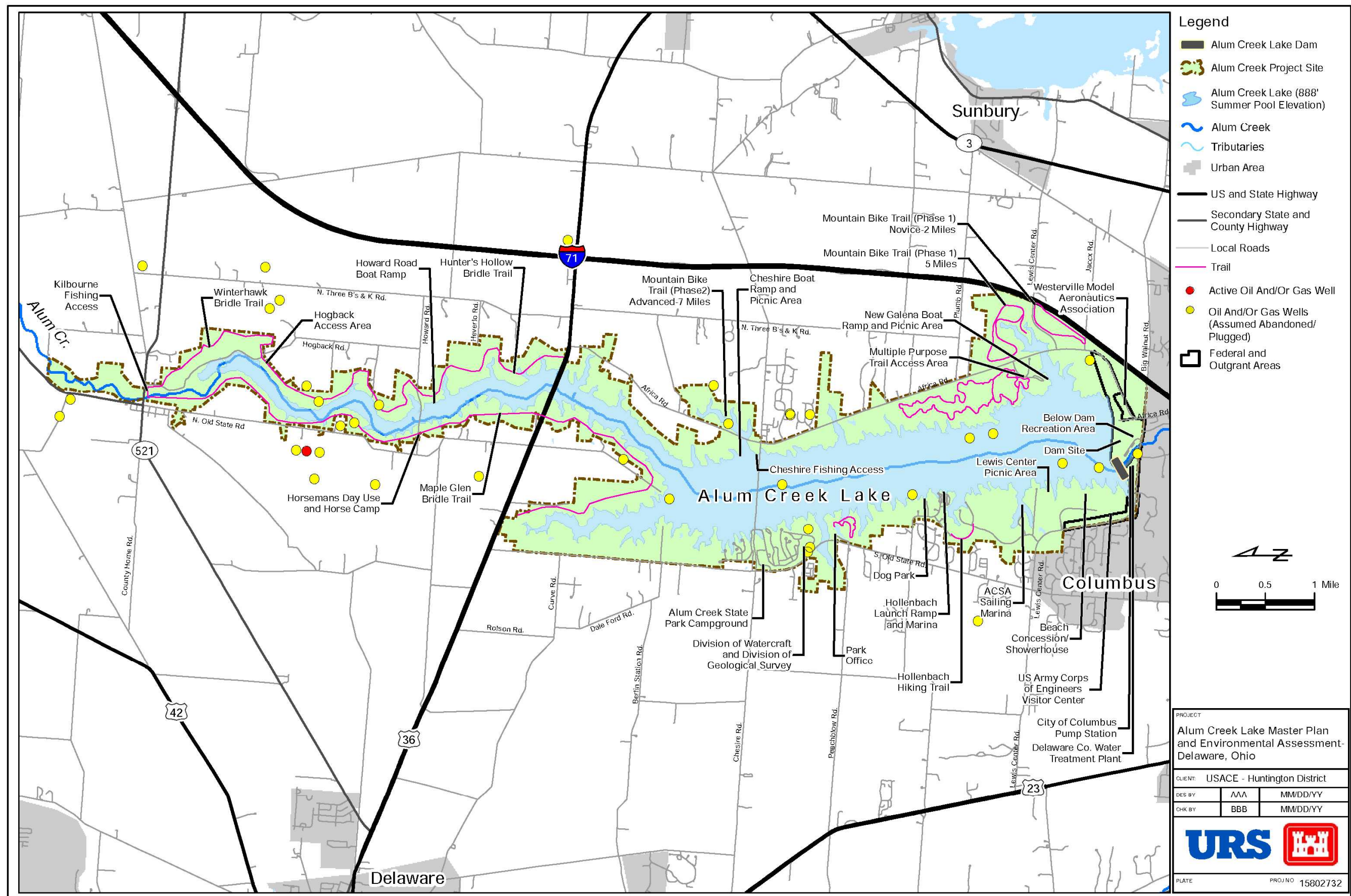


Figure 3-2: Gas Well Locations

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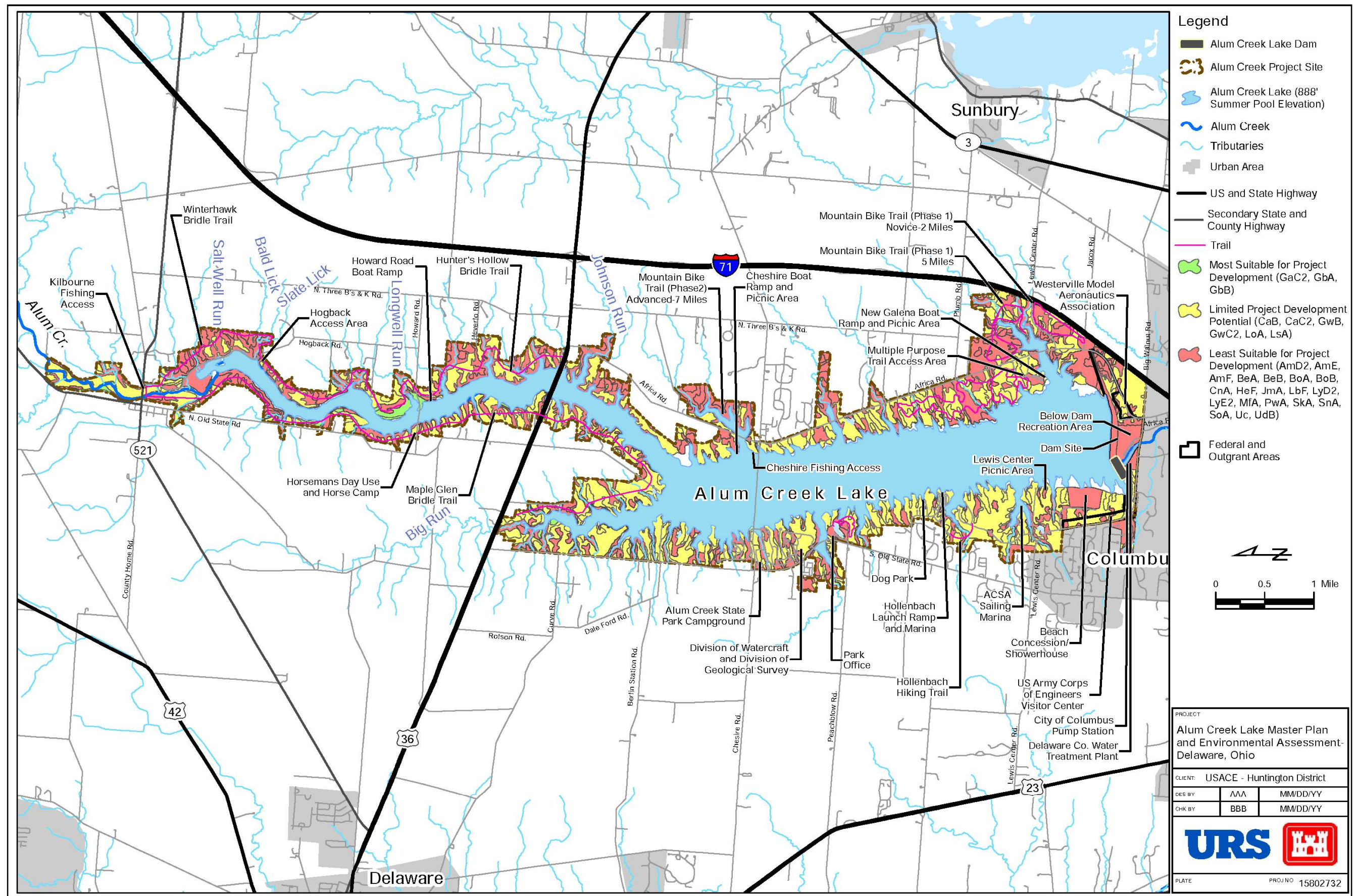


Figure 3-3: Soils Suitability for Project Development

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3.1.4 Land Use/Land Cover

Approximately 45 percent of the Project area is forested (NatureServe, 2007). Land cover in the Alum Creek Lake Project area includes forest, grasslands, herbaceous vegetation, and open water (Figure 3-4). Table 3-2 identifies land cover types in the Project area and the percentage of the total Project in each land cover type.

Table 3-2: Land Cover in the Alum Creek Lake Project

Land Cover	Percent of Project Area
Open Water	42%
North-Central Interior Dry-Mesic Oak Forest and Woodland	27%
North-Central Interior Beech-Maple Forest	14%
Developed Open Space	7%
North-Central Interior Floodplain	3%
Northeastern Interior Dry-Mesic Oak Forest	3%
Appalachian (Hemlock)-Northern Hardwood Forest	1%
Other (developed) includes low, medium, and high intensity developed land	1%
Agriculture	1%
Other (natural) includes herbaceous, successional shrub/scrub, and interior small stream/riparian categories	1%

Source: NatureServe, 2007

3.1.5 Water Resources and Quality

3.1.5.1 Surface Water Resources and Quality

Figure 3-5 identifies the surface waters within the Project area. The approximately 8,400-acre Project is located in Delaware County, Ohio on Alum Creek, a tributary of Big Walnut Creek. Alum Creek is approximately 56 miles long and flows north to south through Morrow and Delaware Counties, merging into Big Walnut Creek in Franklin County. Big Walnut Creek flows into the Scioto River and eventually into the Ohio River. The Project area is approximately 27 miles upstream from the confluence of Alum Creek and Big Walnut Creek (Figure 3-6). The Alum Creek Dam is the only USACE dam on Alum Creek, providing flood risk management and controlling the downstream flow to maintain a sufficient water supply.

Alum Creek Lake receives runoff from a 123 square mile drainage basin. Alum Creek Lake watershed represents only a small portion of the total Scioto River Basin regional watershed, which drains approximately 3,196 square miles of land (Figure 3-6). The drainage areas of Alum Creek and its principal tributaries are presented in Table 3-3.

Table 3-3: Drainage Areas of the Alum Creek and Principal Tributaries

Stream	Location	River Mile	Area (square miles)
Alum Creek	Above mouth of Indigo Creek	42.7	28.4
Indigo Creek	Mouth	42.7	4.5
Alum Creek	Below mouth of Indigo Creek	42.7	32.9
Alum Creek	Above mouth of West Branch	41.5	35.8
West Branch	Mouth	41.5	29.1
Alum Creek	Below mouth of West Branch	41.5	64.9
Alum Creek	Above mouth of Big Run	31.3	89.5
Big Run	Mouth	31.3	11.5
Alum Creek	Below mouth of Big Run	31.3	101.0
Alum Creek	Alum Creek Dam	26.0	123.0

Alum Creek Lake is formed by the dam, the topographical features of the area, and the tributaries, creeks, and streams that discharge into Alum Creek above the dam and within the Project boundary. The surface of Alum Creek Lake measures approximately 3,390 acres and is approximately 10.5 miles long with a mean width of 2,700 feet in the main portion of the lake during the normal summer pool elevation of 888 feet NGVD. The lake extends along Alum Creek with a short arm extending up Big Run on the west side of the lake. The lake shoreline has numerous small ravines and channels that form numerous coves along the 46 miles of shoreline, especially during summer pool elevation. Water depths in the lake vary from 5 to 60 feet with an average depth of 25 to 35 feet.

Water supplies for both Delaware County and Franklin County are obtained from the O'Shaughnessy Reservoir on the Scioto River, Alum Creek Lake on Alum Creek, and the Hoover Reservoir on Big Walnut Creek. The Delaware County Water Company, Inc. (Del-Co) utilizes the Project to provide water to a portion of Delaware County. Alum Creek Lake supplies 1.8 million gallons of water per day to a population of approximately 10,560. The capacity at the water treatment plant is approximately 3.4 million gallons per day (Ohio State University Extension, Fact Sheet, 2010). The City of Columbus also utilizes water from Alum Creek Lake. The water is pumped to the Hoover Reservoir from a pump station that is part of the Alum Creek dam. Water is only pumped from Alum Creek Lake for augmentation purposes when the Hoover Reservoir falls below a certain level.

The area above Alum Creek Lake is largely used for agricultural purposes and water quality conditions generally reflect agricultural pollution from fertilizers, insecticides, and herbicides.

The Ohio EPA uses two broad designations for water quality criteria when evaluating waterways: aquatic life and non-aquatic life uses. Non-aquatic life uses include recreation, human health, and water supply. The Ohio EPA utilizes biological, chemical, and physical criteria to create measurable properties that can be compared to goals specified by each designation.

The Ohio 2010 Integrated Water Quality Monitoring and Assessment Report (IR) identifies and rates four beneficial uses for each watershed assessment unit in the state of Ohio. The Alum Creek Dam-Alum Creek and the Big Run-Alum Creek watershed units were noted as impaired for aquatic life and recreation in 2008 and 2010. Causes for impairment related to aquatic life for the watershed units are direct habitat and flow alterations and nutrients associated with the following sources: channelization of agriculture, non-irrigated crop production, and removal of riparian vegetation. Overall, the watershed assessment units in the Project area have a low priority (0 or 1 point) on the 2010 Section 303(d) List of Prioritized Impaired Waters (Ohio EPA, 2010).

Water quality conditions in Alum Creek Lake for human contact are monitored under the Bathing Beach Monitoring Program of the Ohio Department of Health (ODH). For 2011, the U.S. Geological Survey (USGS) Ohio Water Science Center is performing monitoring on behalf of ODH at Alum Creek Lake. The USGS collects bi-weekly lake water samples at two locations that are transmitted to the ODH for analysis for *E. coli* bacteria levels. If levels are determined to exceed state standards, a second sample may be taken and analyzed to confirm the exceedance. If sampling indicates that bacteria levels present a potential health risk to persons coming into contact with the water, including for recreational purposes such as swimming, the ODH director recommends to the ODNR Division of Parks and Recreation that signs advising the public against swimming due to the bacteriological conditions should be posted. These signs are advisory only and do not mandate beach or lake closure.

The tailwater area is located immediately downstream of the dam where the outflow from the lake is discharged. Water is released from the lake through an intake structure and passes through a tunnel to emerge as outflow. This system allows withdrawal from various water depths and offers a range of choices for outflow rates and other water parameters, including temperature. A minimum flow can be maintained in times of drought to enhance water quality of the downstream reach of Alum Creek.

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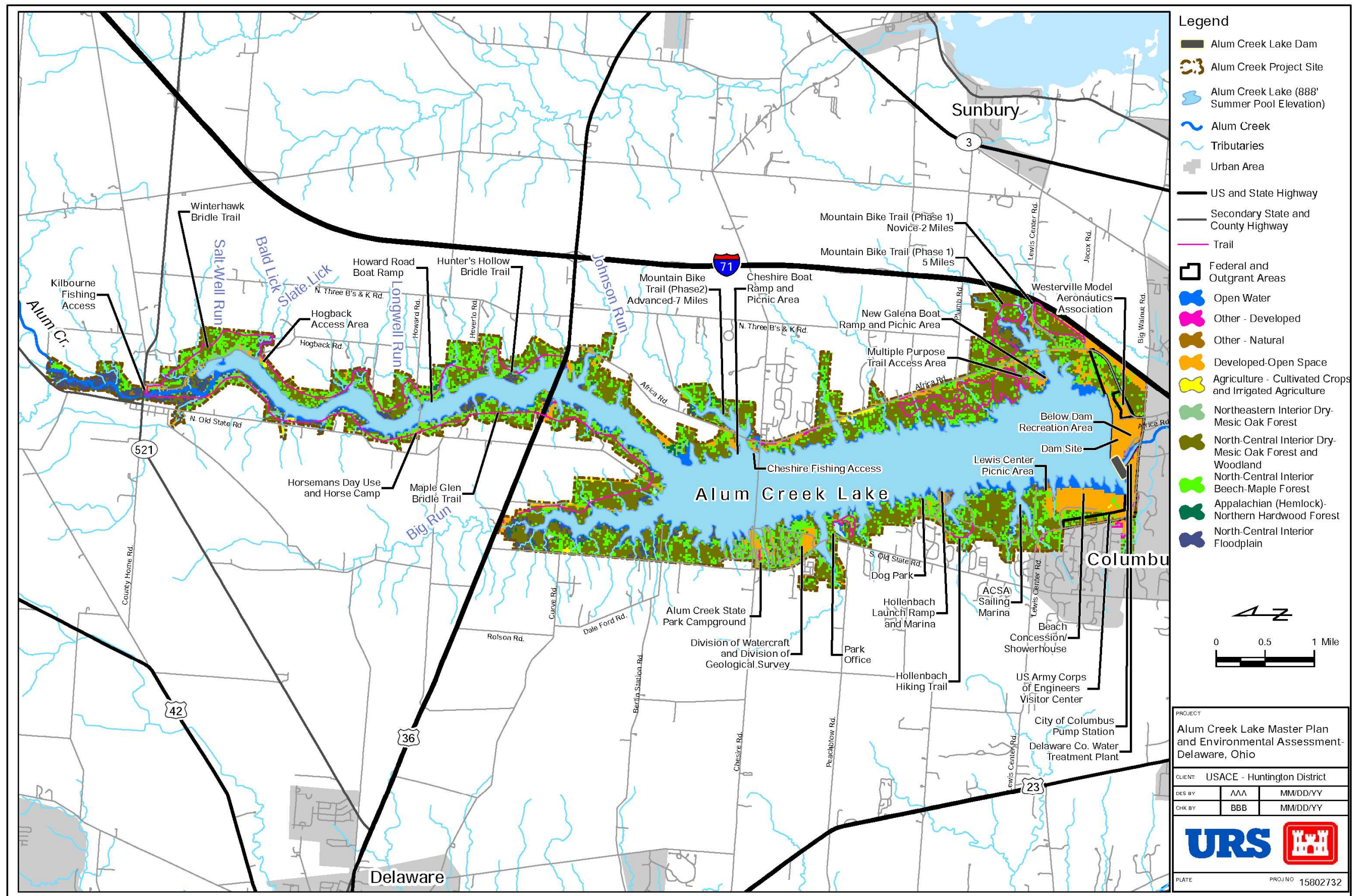
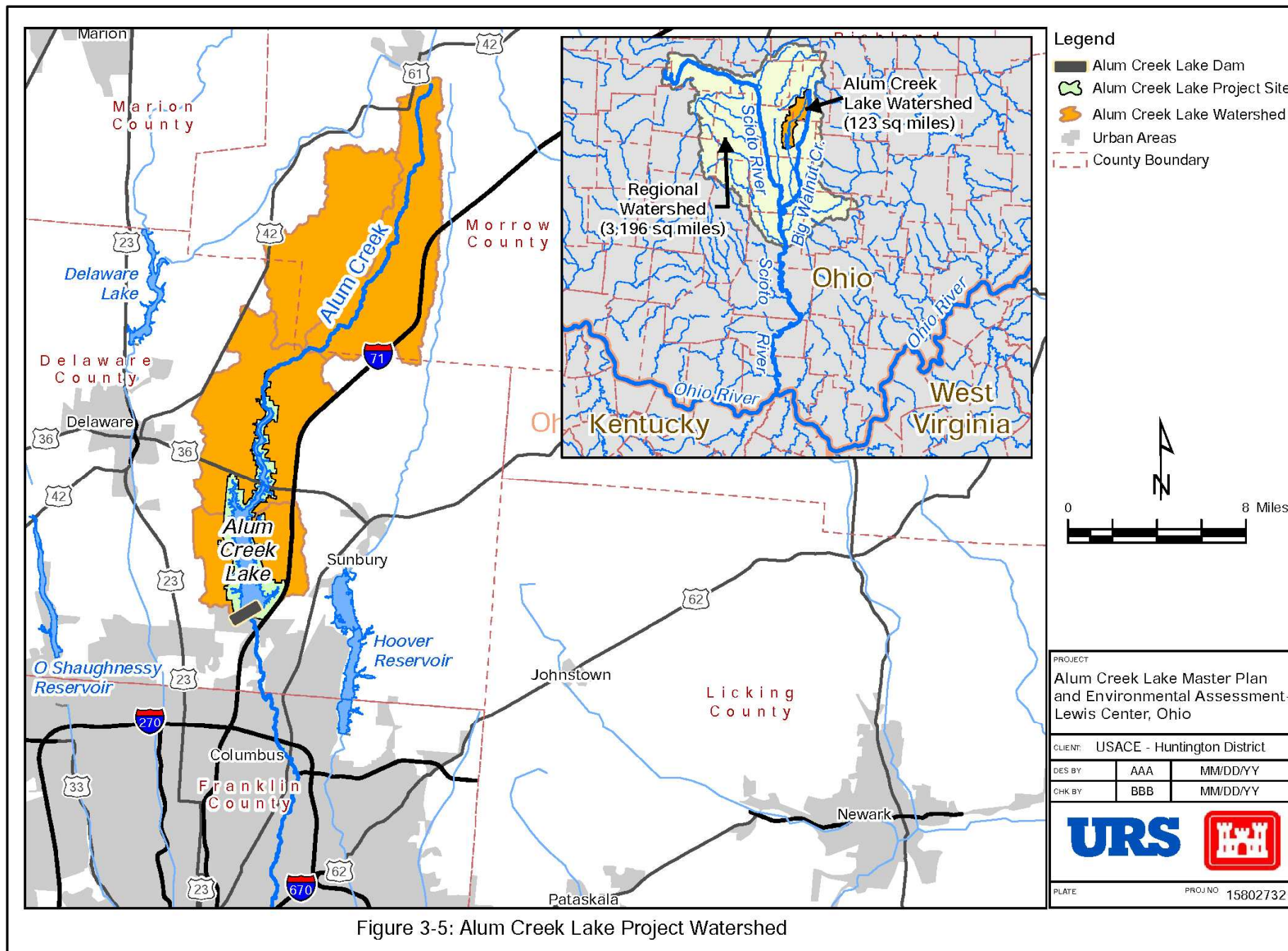


Figure 3-4: Vegetation and Land Cover

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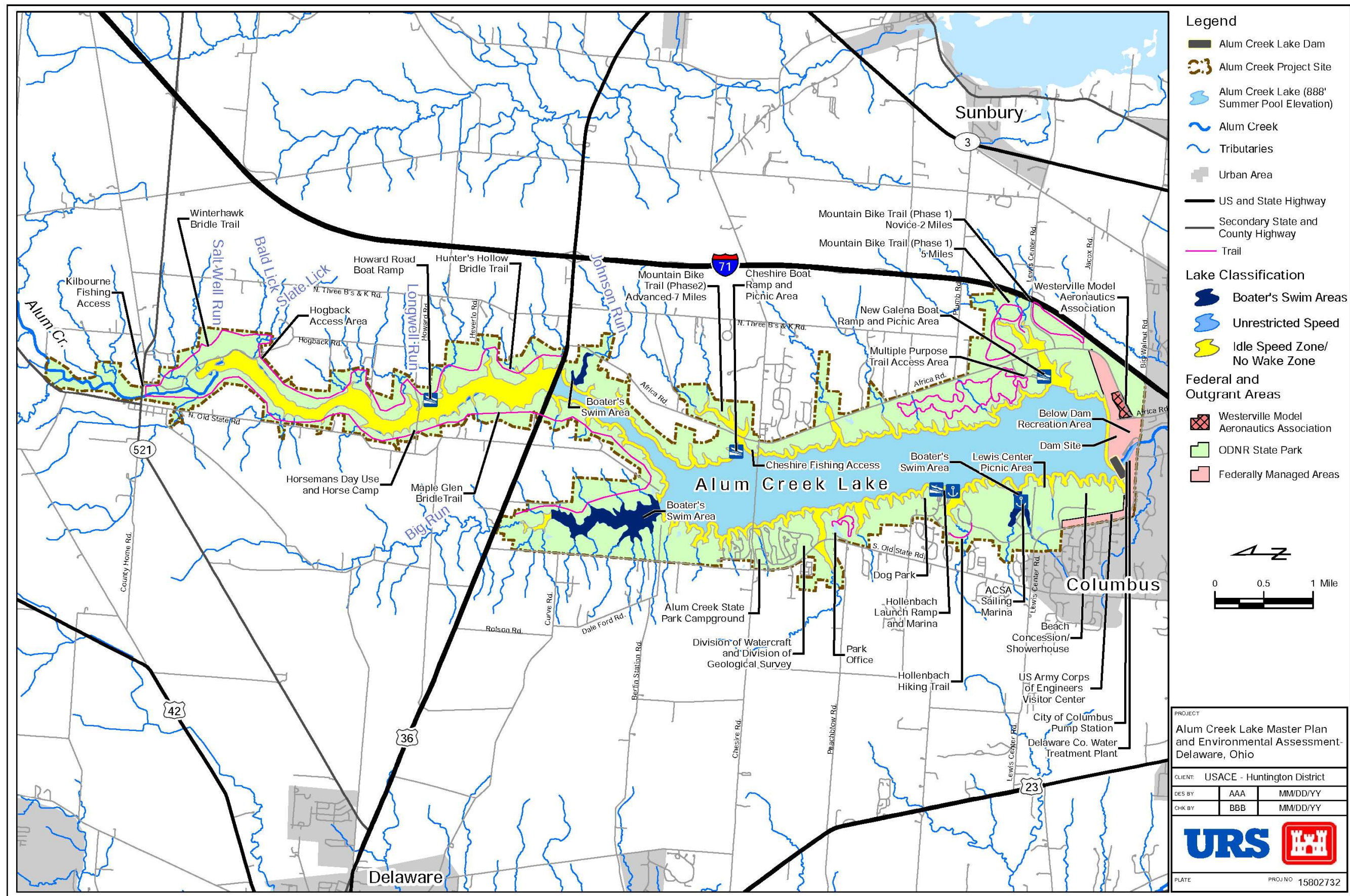


Figure 3-6: Surface Waters Within the Alum Creek Lake Project

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3.1.5.2 Groundwater Resources and Quality

Alum Creek Lake lies in the central portion of Delaware County where an aquifer comprised of Devonian and lower Mississippian formations typically provide poor water yields of less than five gallons per minute (gpm). This is largely due to heavy clays which overlay the impermeable shale bedrock. Water under the shale is generally not tapped because it may be high in sulfur, hydrogen sulfide, and iron (Ohio Department of Natural Resources, 2005a). There are no known groundwater wells within the Project boundary.

3.1.6 Floodplains and Flooding

One of the primary authorized purposes of the Alum Creek Lake Project is flood risk management. The Project area around the lake is designed to store floodwaters to reduce flood risk downstream. Figure 3-7 shows inundation areas between the summer pool elevation of 888 feet NGVD and the maximum flood control pool elevation of 901 feet NGVD. Based on Figure 3-7, the northernmost portions of the lake, including Alum Creek Lake near State Route 521 and the Big Run branch, experience the most significant inundation due to flooding. The areas immediately surrounding the lake are susceptible to moderate inundation due to flooding, which limits future Project development in close proximity to the lake.

Table 3-4 presents the impacts of various lake elevations on recreation areas within the Project boundary. As indicated in the table, impacts become apparent three feet above the summer pool elevation of 888 feet NGVD. As mentioned above, the lake reaches its flood control pool at elevation 901 feet NGVD.

Table 3-4: Project Recreational Facility Impacts Related to Changes in Lake

Elevation (feet NGVD)	Project Impacts
865 (below)	Cheshire, Marina, and New Galena Boat Ramps closed
873 (below)	Campground boat ramp closed
878 (below)	Beach closed (water 300' from guard towers)
882 (below)	Howard Boat Ramp closed
883 (below)	Campground beach closed
885	Winter Pool Elevation
888	Summer Pool Elevation
891 (above)	Beach closed
895 (above)	North Camp Road closed
895.5 (above)	Hogback Road closed
896 (above)	Marina unusable
896.5 (above)	New Galena, Cheshire, and Hollenback Boat Ramps closed
898 (above)	Marina building begins flooding

3.1.7 Air Quality

The USEPA has set National Ambient Air Quality Standards (NAAQS) for six principal air pollutants (also referred to as criteria pollutants): carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter (separate standards for particulate matter with a diameter less than 2.5 microns and for particulate matter with a diameter between 2.5 and 10 microns), and sulfur dioxide. USEPA promulgated standards for particulate matter in 1997 that were revised, in part, in 1996. Delaware County has been designated in nonattainment for the 1997 annual standard for particulate matter less than 2.5 microns in diameter (U.S. Environmental Protection Agency, 2011).

3.1.8 Climate

The climate of Ohio is continental in nature, characterized by moderate extremes of heat, cold, and precipitation, but climatic conditions across the state are varied. Summers are moderately warm and humid, while winters are cold, but generally without extended periods of severe cold. For Delaware County, the average annual high and low temperatures are 84.6°F and 16.6°F, respectively. Delaware County averages 37.58 inches of precipitation annually. Prevailing winds are from the southwest (National Climatic Data Center, 2010).

3.1.9 Noise

Noise is generally defined as unwanted sound. The undeveloped nature of much of the Project and surrounding areas results in few manmade noise sources that regularly contribute to ambient noise levels at most locations within the Project. Southern portions of the Project adjoining or near I-71 are exposed to varying levels of traffic noise from this roadway that decreases with distance from the traffic stream. Within the Project, the only noticeable sources of noise emanate from the vehicles of Project users and motorized boats on the lake. The lack of significant levels of human activity in this area results in ambient noise levels that are usually dominated by natural sources. Noise from these sources dissipate with distance from the source, so boat and motor vehicle traffic noise do not contribute to ambient noise levels in areas of the Project that are far removed from the lake, river, and roadways. Except for days when recreational traffic is heavier (e.g., holiday weekends), manmade sources of noise are generally dispersed to the level that ambient noise levels approach background noise levels emanating from natural sources such as wind and birds.

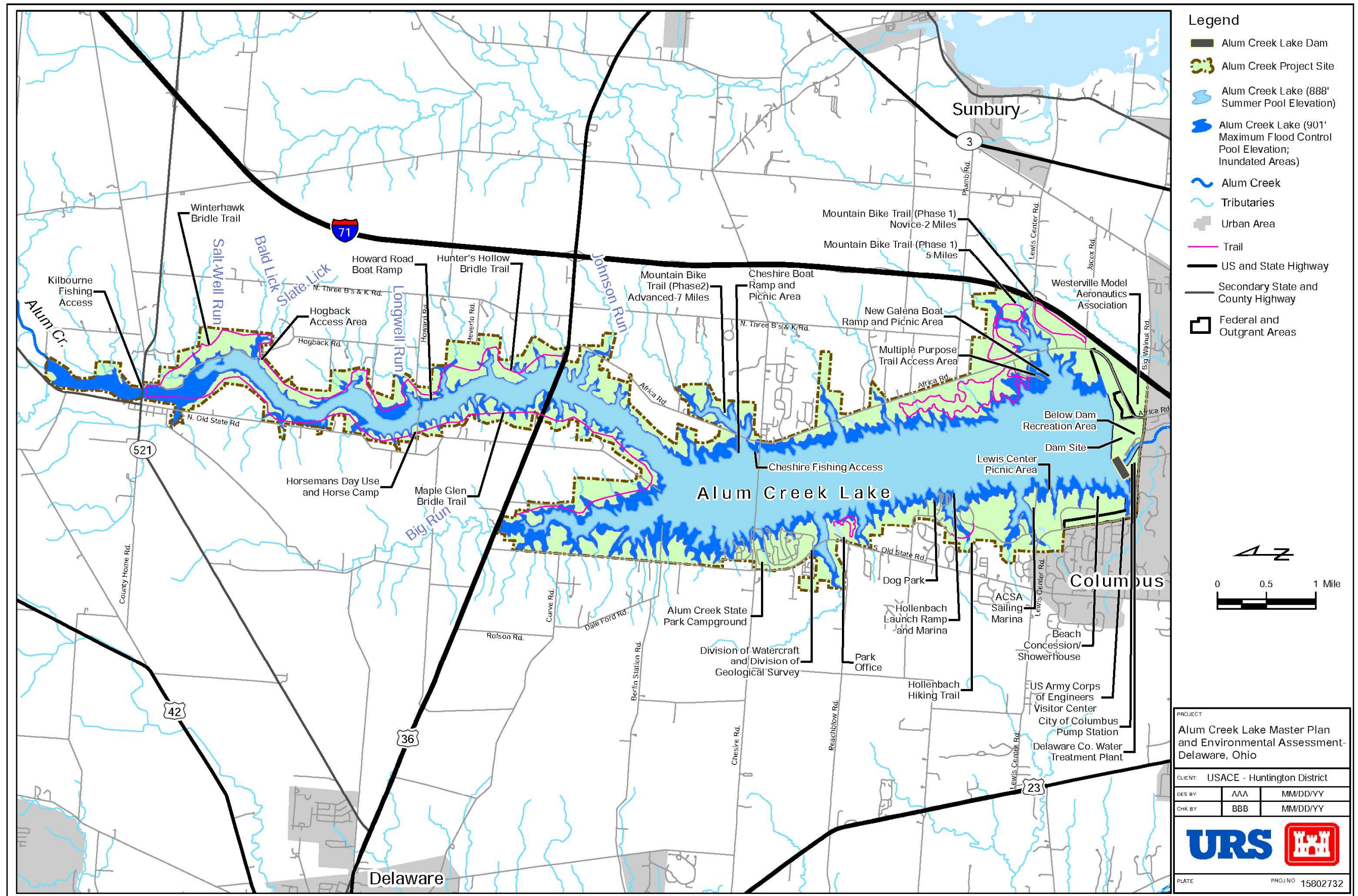


Figure 3-7: Inundation Areas between Summer Pool Elevation and Flood Control Pool Elevation

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3.2 Biological Environment

3.2.1 Vegetation

As described previously in Section 3.1.4, about 48 percent of the Project is forested. The five major forest classifications that dominate the Project landscape consist of the following:

- North-Central Interior Dry-Mesic Oak Forest and Woodlands are found throughout the glaciated regions of the Midwest and can occur on uplands, near floodplains, or on rolling glacial moraines. Forest cover can range from dense to moderately open canopy and there is commonly a dense shrub understory. Fire-resistant oak species, in particular bur oak (*Quercus macrocarpa*), northern red oak (*Quercus rubra*), and/or white oak (*Quercus alba*), dominate the overstory. Hickories including shagbark hickory (*Carya ovata*), bitternut hickory (*Carya cordiformis*), and mockernut hickory (*Carya alba*) are diagnostic in portions of the range of this system. Depending on site location and the overstory canopy density, the understory may include species such as American hazelnut (*Corylus americana*), serviceberry trees (*Amelanchier* spp.), starry false lily of the valley (*Maianthemum stellatum*), blue cohosh (*Caulophyllum thalictroides*), wood nettle (*Laportea canadensis*), white trillium (*Trillium grandiflorum*), wild sarsaparilla (*Aralia nudicaulis*), and stinging nettle (*Urtica dioica*). Occasionally, prairie grasses such as *Andropogon gerardii* and *Panicum virgatum* may be present.
- North-Central Interior Beech-Maple Forests are typically found on flat or rolling uplands with rich loam soil over glacial till. These forests are characterized by a dense tree canopy, which creates a thick layer of humus and leaf litter, developing a rich, dense herbaceous layer. Sugar maple (*Acer saccharum*) and American beech (*Fagus grandifolia*) comprise up to 80 percent of the canopy. Other species that comprise the canopy can include northern red oak (*Quercus rubra*), American basswood (*Tilia americana*), American hornbeam (*Carpinus caroliniana*), and American hophornbeam (*Ostrya virginiana*). The herbaceous layer is very diverse and typically includes Jack in the pulpit (*Arisaema triphyllum*), Clayton's sweetroot (*Osmorhiza claytonia*), smooth Solomon's Seal (*Polygonatum biflorum*), and white trillium.
- North-Central Interior Floodplain is found along rivers across the glaciated Midwest. This forest is characterized by sugar maple, eastern cottonwood (*Populus deltoids*), and willows, especially black willow (*Salix nigra*) in the wettest areas; and green ash (*Fraxinus pennsylvanica*), American elm (*Ulmus americana*), and bur oak in more well-drained areas.

- Northeastern Interior Dry-Mesic Oak Forests are typically closed-canopy forests on flat to gently rolling land. These forests are characterized by various oak species including northern red oak, white oak, black oak (*Quercus velutina*), and scarlet oak (*Quercus coccinea*). Hickories may also dominate mature stands. Red maple (*Acer rubrum*), sweet birch (*Betula lenta*), yellow birch (*Betula alleghaniensis*), and sugar maple may also be present.
- Appalachian (Hemlock) Northern Hardwood Forests are characterized by northern hardwoods. Sugar maple, yellow birch (*Betula alleghaniensis*), and American beech are characteristic, either forming a deciduous canopy or mixed with eastern hemlock or eastern white pine. Other common and sometimes dominant trees include oaks (most commonly red oak), yellow-poplar, black cherry (*Prunus serotina*), and sweet birch (*Betula lenta*).

No timber management activities have taken place at the Project site. Although the ODNR Division of Parks and Recreation manages the vast majority of the Project, the focus of the management is on recreational uses of the State Park rather than on wildlife management. At this time, no definitive plan has been developed for timber management for wildlife enhancement or habitat improvement.

Exotic and invasive plant species are a part of the existing ecosystem in the Project area. These plants have the ability to rapidly disrupt and dominate the vegetative landscape if not aggressively managed, dominating the competition with native species for space, water, and sunlight. Through time, the native plant species will be replaced and the ecology altered. Additionally, the interdependence and connectivity between the flora and fauna will be out of balance, and the fauna may relocate to find the native vegetative resource required for preferred food, shelter, or habitat structure. Typically, once the habitat structure and the vegetative composition of an area changes and the fauna seek out alternative niches, it becomes increasingly difficult to reintroduce these species back into previously inhabited areas. The consequences of such changes in habitat structure and floral and faunal composition may result in negative impacts for recreational opportunities. The most prominent invasive plant species known to occur in the Project area is autumn olive. Autumn olive was introduced to the United States in the 1830's from East Asia and can thrive in a variety of soil types. Autumn olive is considered a threat because it exhibits prolific fruiting and rapid growth, which stifles the growth of native plants. Autumn olive can also disrupt the nitrogen cycle of the soil, which may impact native plant species.

3.2.2 Wetlands

The USACE and USEPA jointly define wetlands as areas inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. In general terms, wetlands can be described as the transition zone between upland and aquatic ecosystems. The USACE requires that a site must have suitable hydrology and must contain hydric soils and predominantly hydrophytic vegetation to be classified as a wetland. Functionally, wetlands are important landscape features because they hold and slowly release floodwater and snow melt. Another function of wetlands is to act as filters to cleanse surface water of impurities, recycle nutrients, and trap sediment. Because these areas tend to be wet, have exposure to sunlight, and are highly fertile, wetlands support a diverse composition of flora and fauna.

According to U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) maps, approximately 125 acres of wetlands exist within the Project area. The NWI maps are a generalized series of maps that give approximate locations of wetland areas using existing sources of information such as soil surveys, previous wetland recordings, and site observations. NWI mapping shows that wetlands mapped in the Project area tend to occur mainly in the southeast and northern portion of the Project, are primarily isolated and scattered, and consist of relatively small areas typically averaging less than three acres in size. However, at the northern end of the Alum Creek branch near State Route 521, the wetland areas are fairly broad, covering approximately 105 acres of the floodplain of Alum Creek. The locations of the approximately 125 acres of potential jurisdictional wetlands in the Project area are shown in Figure 3-8. Table 3-5 provides information about the different types of wetlands.

Table 3-5: Wetlands in Project Area

Wetland Type	Classification¹	Number of Sites	Approximate Total Acreage
Palustrine, emergent, temporary or seasonally flooded wetland	PEM	15	17.29
Palustrine, forested, broad-leaved deciduous, temporarily or seasonally flooded wetland	PFO	33	99.72
Palustrine, scrub-shrub, broad-leaved deciduous, seasonally flooded wetland	PSS	7	8.33

¹Source: U.S. Fish and Wildlife Service, 1979

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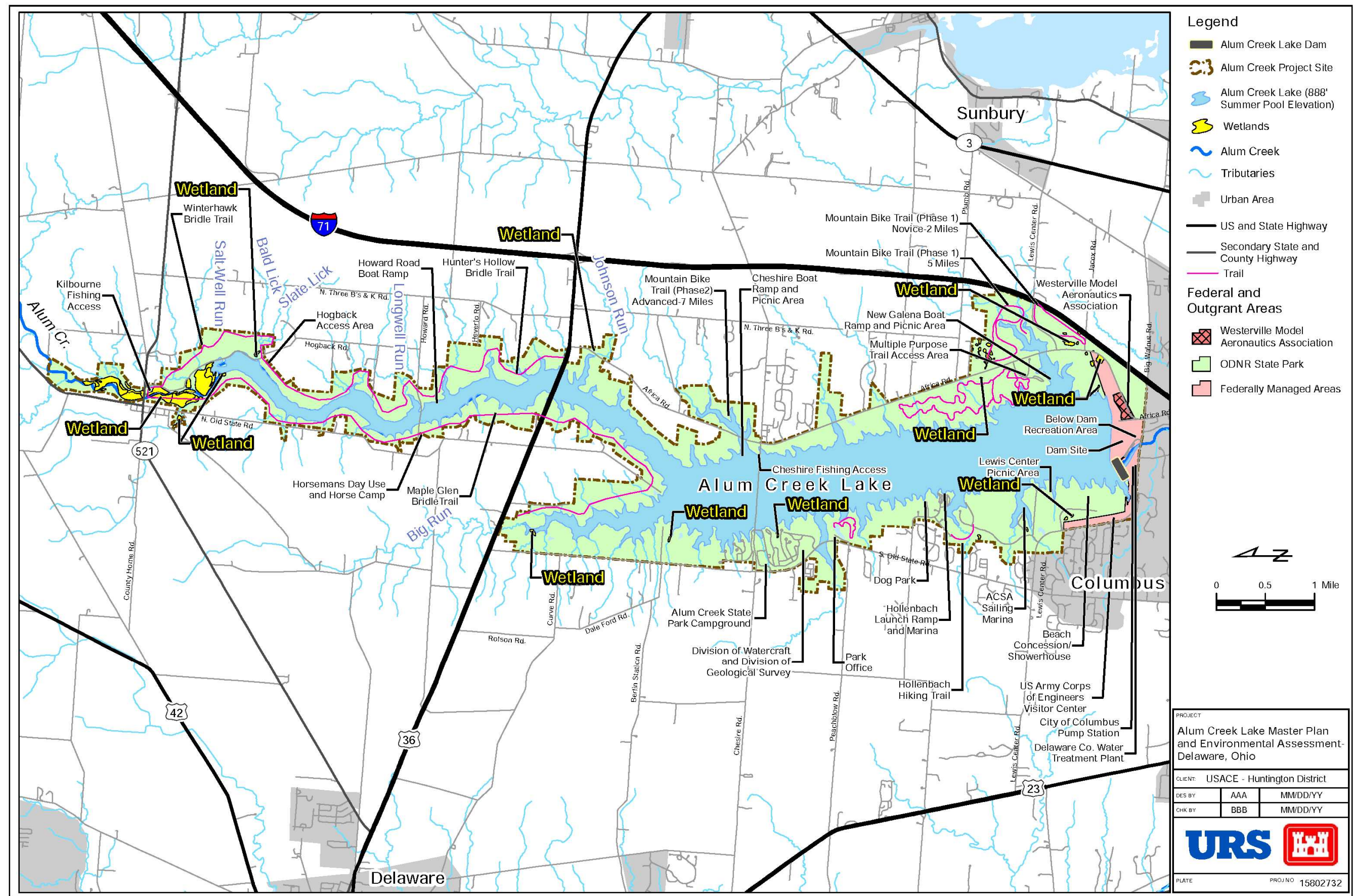


Figure 3-8: NWI-Delineated Wetlands

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3.2.3 Terrestrial Wildlife

According to the ODNR Division of Wildlife, the Project area supports a diverse array of amphibian, bird, mammal, and reptile species. The scientific and common names of the species most commonly found at the Project are listed in Table 3-6.

Table 3-6: Terrestrial Fauna Common to the Project Area

Taxonomy	Common Name	Scientific Name
Amphibians	Marbled salamander	<i>Ambystoma opacum</i>
	Spotted salamander	<i>Ambystoma maculatum</i>
	Northern spring peeper	<i>Pseudacris crucifer crucifer</i>
	Bullfrog	<i>Rana catesbeiana</i>
	Green frog	<i>Rana clamitans melanota</i>
Birds	Wild turkey	<i>Meleagris gallopavo</i>
	American crow	<i>Corvus brachyrhynchos</i>
	Tufted titmouse	<i>Baeolophus bicolor</i>
	White-breasted nuthatch	<i>Sitta carolinensis</i>
	Wood thrush	<i>Hylocichla mustelina</i>
	Ovenbird	<i>Seiurus aurocapilla</i>
	Scarlet tanager	<i>Piranga olivacea</i>
	Warbler	<i>Dendroica spp.</i>
	Yellow-billed cuckoo	<i>Coccyzus americanus</i>
	Pileated woodpecker	<i>Dryocopus pileatus</i>
	Barred owl	<i>Strix varia</i>
Mammals	White-tailed deer	<i>Odocoileus virginianus</i>
	Raccoon	<i>Procyon lotor</i>
	Squirrel	<i>Sciuridae</i>
	Cottontail rabbit	<i>Sylvilagus sp.</i>
	Woodchuck	<i>Marmota monax</i>
	Muskrat	<i>Ondatra zibethicus</i>
	Mink	<i>Neovison vison</i>
	Opossum	<i>Didelphis virginiana</i>
Reptiles	Common snapping turtle	<i>Chelydra serpentina serpentina</i>
	Musk turtle	<i>Sternotherus odoratus</i>
	Red-eared slider	<i>Trachemys scripta elegans</i>
	Northern Copperhead	<i>Agkistrodon contortrix mokeson</i>
	Water snake	<i>Nerodia sp.</i>
	Garter snake	<i>Thamnophis sp.</i>

Source: Ohio Department of Natural Resources, Division of Wildlife, 2011

The Project is not listed by ODNR as a Wildlife Area, but hunting and trapping are allowed in designated areas. Common game and fur species include: white-tail deer, cottontail rabbit, squirrel, woodchuck, raccoon, muskrat, mink, and opossum (ODNR, Division of Wildlife, 2011).

Additionally, the southern flying squirrel (*Glaucomys volans*) is found in mature beech-maple forests and the eastern chipmunk (*Tamias striatus*) is found in deciduous woods. The masked shrew (*Sorex cinereus*), eastern mole (*Scalopus aquaticus*), fox, and mice may also be present in the Project (FACT, 2005).

Alum Creek Lake is a haven for nesting and migratory birds. Red-tailed hawks, American kestrels, and northern harriers (marsh hawks) migrate in the fall and are seen over open fields. Ring-necked pheasant and mourning dove are popular game birds. Rare birds observed at the Project include: bald eagle (*Haliaeetus leucocephalus*), northern goshawk (*Accipiter gentilis*), osprey (*Pandion haliaetus*), king rail (*Rallus elegans*), snowy owl (*Bubo scandiacus*), long-eared owl (*Asio otus*), great egret (*Ardea alba*), cattle egret (*Bubulvus ibis*), and sandhill crane (*Grus canadensis*). Waterfowl such as Canadian geese (*Branta canadensis*), mallards (*Cairina moschata*), and wood ducks (*Aix sponsa*) are also commonly seen (ODNR, Division of Wildlife, 2011).

3.2.4 Aquatic Life

Alum Creek Lake sustains a diverse composition of aquatic species as listed in Table 3-7.

Table 3-7: Native and Stocked Fish Species in Alum Creek Lake

Common Name	Scientific Name
Bullhead (yellow, black, or brown)	<i>Ameiurus spp.</i>
White sucker	<i>Catostomus commersoni</i>
Spotfin shiner	<i>Cyprinella spilopterus</i>
Common carp	<i>Cyprinus carpio</i>
Gizzardshad	<i>Dorosoma cepedianum</i>
Muskellunge	<i>Esox masquinongy</i>
Channel catfish	<i>Ictalurus punctatus</i>
Brook silverside	<i>Labidesthes sicculus</i>
Bluegill	<i>Lepomis macrochirus</i>
Smallmouth bass	<i>Micropterus dolomieu</i>
Largemouth bass	<i>Micropterus salmoides</i>
White bass	<i>Morone chrysops</i>
Emerald shiner	<i>Notropis atherinoides</i>
Bluntnose minnow	<i>Pimephales notatus</i>
White crappie	<i>Pomoxis annularis</i>
Black crappie	<i>Pomoxis nigromaculatus</i>
Walleye	<i>Stizostedion vitreum</i>
Saugeye	<i>Stizostedion vitreum x S. canadense</i>

Source: U.S. Army Corps of Engineers, 2003

Alum Creek Lake is regarded as one of the best fishing lakes in Ohio, and numerous fishing tournaments are held there each year. The ODNR Division of Wildlife regularly stocks the lake with saugeye and muskellunge. The lake provides habitat for many species. In development of the lake, timber was left in many of the cove areas so that it would be below the summer pool elevation to provide underwater habitat to benefit fisheries. The adjacent wetlands and shallow water areas provide additional spawning areas, as well as hunting areas for predator birds and other wildlife. The natural physiology also provides for structure that is conducive to a healthy aquatic system. Existing structure like rocky bottoms, sandy bottoms, pooling areas, rock outcrops, and grassy areas combine to provide habitat for aquatic life. This habitat is also well suited to many invasive (non-native) species such as zebra mussels, which were discovered in Alum Creek Lake in 1995. The zebra mussel is a small freshwater mussel that was probably introduced to Alum Creek Lake through attachment to boat hulls. Zebra mussels compete for many of the same resources as the native mussels and invertebrates, which in turn, reduces native species population, including fish (Friends of Alum Creek and Tributaries, 2005).

3.2.5 Rare, Threatened, and Endangered Species

Threatened or endangered species that may occur within the locale of the Alum Creek Lake Project are listed in Table 3-8 below along with their State and Federal status (U.S. Fish and Wildlife Service, 2010; Ohio Department of Natural Resources, 2010). USFWS maintains lists of rare plants and wildlife known to occur in each county of the United States. There is no designated critical habitat under Section 7 of the Endangered Species Act present within the Project area. Correspondence from the USFWS regarding endangered and threatened species is included in Appendix B.

Table 3-8: Listed Rare, Threatened and Endangered Species Potentially Occurring at Alum Creek Lake

Taxonomic Group	Scientific Name	Common Name	Federal Status	State Status
Freshwater Mussel	<i>Pleurobema clava</i>	clubshell mussel	Endangered	Endangered
	<i>Villosa fabalis</i>	rayed bean mussel	Proposed Endangered	Endangered
	<i>Epioblasma triquetra</i>	snuffbox	Proposed Endangered	Endangered
Mammal	<i>Myotis sodalis</i>	Indiana Bat	Endangered	Endangered

Source: U.S. Fish and Wildlife Service, 2010

Federally-protected species known to have occurred in Delaware County include one mammal, the Indiana bat (*Myotis sodalis*), and one mussel species, the clubshell mussel (*Pleurobema clava*). The snuffbox (*Epioblasma triquetra*) and rayed bean mussel (*Villosa fabalis*) are both

candidate species proposed for listing on the Federal list. All four species are described below (U.S. Fish and Wildlife Service, 2010).

The Indiana bat is medium-sized and closely resembles the little brown bat although it differs in color. The Indiana bat uses two distinct habitat types during the course of a year, caves and under tree bark or in cavities of dead trees. In August, the Indiana bat migrates south to limestone caves. In spring, the Indiana bat migrates north, where females establish maternity colonies beneath the loose bark of dead trees. Males tend to use caves during the summer. Occasionally, both males and females have been found beneath the bark of living trees and within the cavities of dead trees. The Project area appears to have suitable habitat for this species.

In response to Section 7 of the Endangered Species Act coordination conducted in connection with a 2006 PEA by the Federal Energy Regulatory Commission in similar habitats in the region, the USFWS recommended that tree clearing be restricted from April 1 to November 15 to avoid affecting summer roosting of Indian bats. With implementation of this mitigation, the Federal Energy Regulatory Commission determined that the project may affect but is not likely to adversely affect Indiana bats.

The clubshell mussel has a triangular outline, a maximum length of 3.5 inches, and is typically tan or yellow in color (Michigan State University Extension, 2011). This mussel is found buried up to four inches in depth in medium to small rivers, and prefers clean, loose sand and gravel substrates. Alum Creek Lake and its tributaries appear to have suitable habitat for this species.

The rayed bean is a small mussel usually less than two inches in length. The rayed bean mussel is typically found in smaller headwater creeks, although it has been recorded in larger rivers. The mussels are usually found in or near shoal or riffle areas and in the shallow, wave-washed areas of glacial lakes. Substrates typically include gravel and sand, and it is often found buried among roots of vegetation (Ohio River Valley Ecosystem Team, 2002). As of this writing, this species has not been reported in the Project area.

The snuffbox mussel has a triangular shell generally two inches in length and yellow or yellowish green in color with green rays or blotches. The snuffbox is typically found in medium to large rivers in clear, gravel riffles. At the time of the writing of this PEA, this species has not been reported at the Project area.

While no longer listed as a threatened species, the bald eagle (*Haliaeetus leucocephalus*) is protected under The Bald and Golden Eagle Protection Act of 1940, the Migratory Bird Treaty

Act of 1918, and the Lacey Act of 1900. The Bald and Golden Eagle Protection Act provides protection for the bald and golden eagles by prohibiting the take, possession, sale, purchase, barter, offer to sell, transport, and export or import of any bald or golden eagle, alive or dead, including any part, nest, or egg. The Migratory Bird Treaty Act protects birds that migrate across international borders. The Lacey Act protects bald eagles by making it a federal offense to take, possess, transport, sell, import, or export their nests, eggs, and parts that are taken in violation of any state, tribal, or U.S. law. Bald eagles have been sighted and have the potential to inhabit the Project area as it provides desirable large trees near the lake for nesting, as well as fish as the primary food source.

3.3 Socioeconomic Environment

3.3.1 Population and Employment

The Master Plan Update defined the area of influence for Project recreation users as the area where the majority of the visitors to the Project live. Based on the nature of the recreational activities provided at the Project and the availability of comparable competing recreational facilities, it was determined that the vast majority of Project visitors reside within a one-hour driving distance (Figure 3-9). A one-hour drive time was used because the Project is very close to an urban area (Columbus) with numerous indoor and outdoor recreational activities competing to satisfy local and regional recreational needs. With so many competing facilities, it is unlikely that visitors would drive more than one hour to visit Alum Creek. This area of influence was divided into two subareas as follows:

- **Primary Area of Influence:** The area within a 30-minute drive of the Project. Due to their proximity, residents in the primary area of influence are expected to make the Project a destination for all of the recreational opportunities available at the Project.
- **Secondary Area of Influence:** The area between a 30- and 60-minute drive of the Project. Residents in the secondary area of influence are expected to visit the Project for specific reasons; however they are not expected to make the Project a destination solely for general day-use activities (such as picnicking) that are also available in their local area.

There are two counties within the primary area of influence and eight counties within the secondary area of influence. The majority of the primary area of influence consists of Delaware and Franklin Counties in Ohio. The secondary area of influence includes portions of Fairfield, Knox, Licking, Madison, Marion, Morrow, Pickaway and Union Counties in Ohio.

Demographic data (population and age) were compiled from data reported by the U.S. Census Bureau and regional and State data centers. These data were analyzed to determine the population within the areas of influence and how that population is projected to change by 2020. The populations of the counties in the area of influence are projected to increase at different rates. The projected percentage change was determined for each area of influence based on the change in the estimated population in each county.

The estimated populations for the primary and secondary areas of influence are displayed in Table 3-9. The population in the primary area of influence is projected to increase by 23.3 percent by 2020. The population in the secondary area of influence is projected to increase by 23.8 percent by 2020.

Table 3-9: Existing and Projected Population in Areas of Influence

Area of Influence	2000 Population	2010 Population Estimate	2020 Projection	Projected Growth 2000–2020
Primary	1,178,967	1,337,628	1,453,730	23.3%
Secondary	554,444	626,330	686,570	23.8%

Source: Ohio Department of Development, 2003, and U.S. Census Bureau, 2011

Changes in the percentage of the population in each age group were based on projected changes at the county level from the Ohio Department of Development. The analysis combined the county estimates to estimate the percent change in each age group for each area of influence, as shown in Table 3-10. Within the primary area of influence, the percentage of people 19 and under is projected to decrease from 28.5 percent in 2000 to 27.0 percent by 2020. The percentage of young adults between 20 and 44 is expected to decrease significantly from 41.5 percent of the population to 35.9 percent of the population, while the percentage of older adults between the ages of 45 and 64 is expected to increase significantly from 20.4 percent to 25.0 percent. The percentage of people over 65 is projected to increase from 9.6 percent in 2000 to 12.0 percent by 2020. The population in the secondary area of influence is projected to increase 23.8 percent from 2000 to 2020. Within the secondary area of influence, the percentage of people 19 and under is projected to decrease slightly from 28.6 percent in 2000 to 27.2 percent by 2020. The percentage of younger adults between 20 and 44 is expected to decrease from 36.2 percent of the population to 33.1 percent of the population, while the percentage of older adults between the ages of 45 and 64 is expected to increase from 23.4 percent to 25.6 percent. The percentage of people over 65 is projected to increase significantly from 11.7 percent in 2000 to 14.2 percent by 2020.

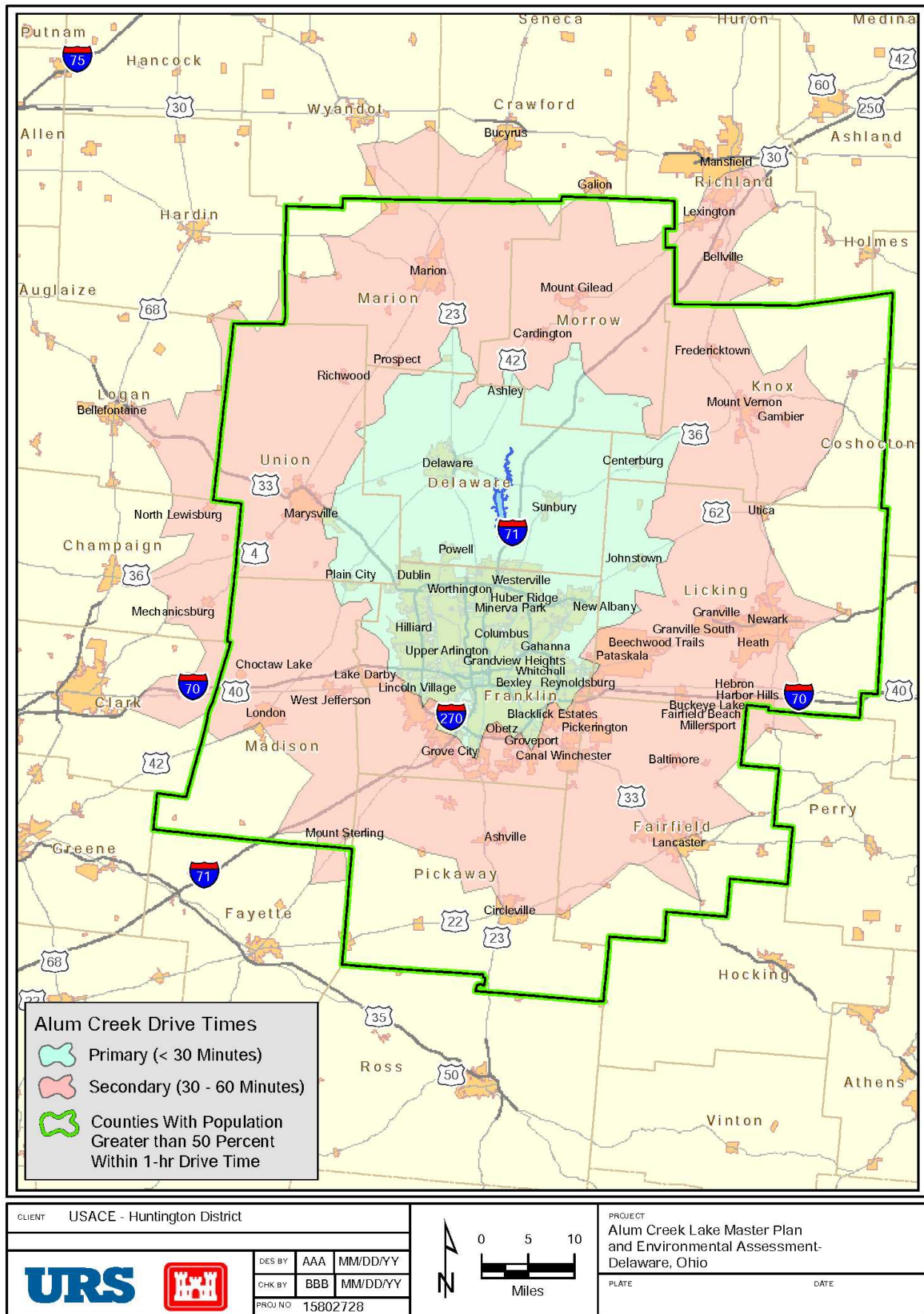


Figure 3-9: Area of Influence

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Table 3-10: Age Distribution of Population by Area of Influence

Age Group	Primary			Secondary		
	2000	2010	2020	2000	2010	2020
<5	7.3%	7.2%	6.9%	6.6%	6.3%	6.6%
5-19	21.2%	20.4%	20.1%	22.0%	21.3%	20.6%
20-44	41.5%	37.9%	35.9%	36.2%	31.7%	33.1%
45-64	20.4%	24.6%	25.0%	23.4%	27.8%	25.6%
≥65	9.6%	9.9%	12.0%	11.7%	12.9%	14.2%

Source: Ohio Department of Development, 2003, and U.S. Census Bureau, 2011

The median incomes of households in the areas of influence were estimated using a weighted average of the average 2009 median incomes of the counties in the area of influence. The median household income in the primary and secondary areas of influence was \$52,318 and \$50,152, respectively, compared to the median household income of \$45,467 for Ohio and \$50,221 for the United States as a whole.

Employment by industry category in Delaware County in 2008 is summarized in Table 3-11. Top ten employers in Delaware County as of 2008 are listed in Table 3-12. Trade, transportation, and utilities represented the largest source of employment, followed closely by professional and business services. This latter category has grown significantly over the past ten years, reflecting spillover growth in the white collar sector from the City of Columbus and Franklin County. The largest employer in the county is the Delaware School System.

Table 3-11: 2008 Delaware County Employment by Industry Category

Industry Category	Employment	Percent of Total County Work Force
Natural resources and mining	299	0.43 %
Construction	2,644	3.80 %
Manufacturing	6,113	8.78 %
Trade, transportation, utilities	15,008	21.56 %
Information services	896	1.29 %
Financial services	5,101	7.32 %
Professional, business services	13,938	20.1 %
Education, health services	6,069	8.71 %
Leisure and hospitality services	9,765	14.1 %
Other services	1,824	2.62 %
Federal government	257	0.37 %
State government	911	1.31 %
Local government	6,817	9.79 %
Total	69,642	100.00%

Source: Ohio Department of Development, Office of Policy Research and Strategic Planning

Table 3-12: Top Ten Employers in Delaware County in 2008

Order of Importance	Delaware County Employers
1	Delaware City Schools
2	JP Morgan Chase & Co.
3	Kroger Co.
4	McGraw Hill Companies
5	Ohio Wesleyan University
6	Ohio Health/Grady Memorial Hospital
7	Olentangy Local Schools
8	PPG Industries
9	Showa Corp./American Showa Inc.
10	State of Ohio

Source: Ohio Department of Development, Office of Policy Research and Strategic Planning

3.3.2 Environmental Justice

Executive Order (EO) 12898, Federal Action to Address Environmental Justice in Minority Populations and Low Income Populations, and the February 11, 1994 Presidential Memorandum providing guidance for this EO, require Federal agencies to develop strategies for protecting minority and low-income populations from disproportionate and adverse effects of Federal programs and activities. The EO is “intended to promote non-discrimination in Federal programs substantially affecting human health and the environment.” An environmental justice evaluation is performed to evaluate the impact of a project on the potentially affected population and to ascertain whether target populations would be affected more adversely than other residents.

As of July 2011, only limited data from the 2010 Census were available from the U.S. Census Bureau. Population estimates and estimates of certain population statistics were available for 2008. These data were reviewed to determine total population and racial composition of Ohio as a whole and separately for Delaware County, which is the area that would be most affected by the Proposed Action. The total 2010 population of Ohio was 11,536,504. Based on 2008 Census Bureau population estimates, minorities accounted for 17.5 percent of the total population for the State as a whole. The total 2010 population of Delaware County was 174,214. Based on 2008 estimates, minorities accounted for approximately 11.4 percent of the total population of Delaware County. Statistics about income and poverty have not yet been released for the 2010 Census (U.S. Census Bureau, 2011).

Because 2010 Census block level and block group level data are not yet available, 2000 Census data were reviewed. In 2000, minorities represented approximately 15.9 percent of the population of the State as a whole, while minorities represented roughly 6.4 percent of the total

population of Delaware County. Also in 2000, 10.3 percent of the total State population was below the poverty level, while the portion of the population of Delaware County below the poverty level was 3.7 percent. Delaware County has experienced considerable growth and development since 2000, spurred by the growth of the nearby City of Columbus and Franklin County. For this reason, the 2000 Census data may not represent a valid picture of the population characteristics of the Project locale.

3.3.3 Transportation and Traffic

Interstate 71 (I-71) parallels the Project area on the east side in a north-south direction. Major east-west arterials traversing the site include US 36/SR 37, Cheshire Road, and SR 521. US 36/SR 37, which bisects the Project area, provides access to the City of Delaware and a connection to I-71.

The primary transportation network adjacent to the site includes Old State Road, Lewis Center Road, Africa Road, and Hogback Road. This roadway network generally provides good access to Project recreational areas. The roadway network north of US 36/SR 37 including North Old State Road, Hogback Road, and SR 521, is rural in nature with very minimal congestion and low traffic volumes. Due to more urban land use south of US 36/SR 37, higher traffic volumes and moderate congestion exists, specifically in the most southern reaches of the Project. South Old State Road provides access to some major recreation features at Alum Creek State Park including the campground and Hollenback Marina and boat ramp. Lewis Center Road provides access to the State Park Beach Area, USACE Visitor Center, and the Below Dam Recreation Area. Africa Road provides access to Dinneen Field and the New Galena Boat Ramp and Picnic Area.

Entrances to recreational areas generally operate well, however some congestion and delays have been noted at the entrance to the Below Dam Recreation Area from Lewis Center Road. Current on site vehicular congestion is typically associated with a lack of parking or inefficient boat ramp operations and associated parking. Overall peak traffic associated with recreation at the Project is typically during weekends, holidays, and after work hours, and typically does not impact peak hour traffic conditions associated with commute to work travel.

3.3.4 Recreation

The Project provides a wide range of recreational activities. Table 3-13 lists the recreational activities that are available at the Project, locations, and the available facilities. The recreational activities are grouped by major type of recreational pursuit. Figure 3-10 shows the locations of the recreation areas at the Project.

Table 3-13: Recreational Facilities at the Project

Recreational Activity	Location	Description
Boating	Alum Creek Sailing Marina	<ul style="list-style-type: none"> • 135 boat slips • Parking area for vehicles and trailers
	Alum Creek Lake	<ul style="list-style-type: none"> • 3,390 acres
	Alum Creek State Park Campground	<ul style="list-style-type: none"> • 2-lane launch ramp • Parking area for vehicles and trailers
	Cheshire Boat Ramp and Picnic Area	<ul style="list-style-type: none"> • 4-lane launch ramp • Parking area for vehicles and trailers
	Howard Road Boat Ramp	<ul style="list-style-type: none"> • 2-lane launch ramp • Parking area for vehicles and trailers
	New Galena Boat Ramp and Picnic Area	<ul style="list-style-type: none"> • 4-lane launch ramp • Parking area for vehicles and trailers
	Hollenback Marina	<ul style="list-style-type: none"> • 4-lane launch ramp • 224 boat slips • Parking area for vehicles and trailers
Camping	Alum Creek Lake	<ul style="list-style-type: none"> • Boat camping permitted at 2 coves around the lake
	Alum Creek State Park Campground	<ul style="list-style-type: none"> • 286 campsites with electrical hookups (20, 30, and 50 amps) • 3 full-service campsites with electric, sewer, and water hookups • 3 cedar cabins • 4 small camper cabins • 1 large camper (log) cabin • Group camping site provides primitive camping opportunities
	Horseman's Day Use and Horse Camp Area	<ul style="list-style-type: none"> • 30 primitive campsites
Fishing	Alum Creek Lake	<ul style="list-style-type: none"> • Access available from shore, boat ramps, and marina
	Below Dam Area	<ul style="list-style-type: none"> • Fishing access provided with sidewalk to tailwaters
	Cheshire Fishing Access	<ul style="list-style-type: none"> • Fishing access provided
	Howard Road Boat Ramp	<ul style="list-style-type: none"> • Fishing access provided
	Kilbourne Fishing Access	<ul style="list-style-type: none"> • Fishing access provided
	Lewis Center Picnic Area	<ul style="list-style-type: none"> • Fishing access provided
Hunting	Alum Creek State Park	<ul style="list-style-type: none"> • Designated hunting and trapping areas (approximately 3,500 acres)

Recreational Activity	Location	Description
Other Activities (e.g., hiking, disc golf)	Below Dam Area	<ul style="list-style-type: none"> Model airplane field (Dinneen Field) is located in this area Trails are also located here
	Friends of Alum Creek Dog Park	<ul style="list-style-type: none"> 4-acres devoted to dog park
	Mountain Biking	<ul style="list-style-type: none"> 3 trails of varying difficulty located in the southeast portion of the Project
	New Galena Boat Ramp and Picnic Area	<ul style="list-style-type: none"> 18-hole disc golf course Multi-purpose trail (7 miles) which can be used for hiking, snowmobiling, dog sledding, cross country skiing
	State Park Office	<ul style="list-style-type: none"> Access to Park Office Hiking Trail (1.5 miles) and Hollenback Hiking Trail
	Visitor Center	<ul style="list-style-type: none"> Amphitheater with projection screen and stand provided near the Visitor Center
Picnicking	Beach	<ul style="list-style-type: none"> Multiple picnic tables located throughout the area
	Below Dam Area	<ul style="list-style-type: none"> Three picnic shelters, picnic tables, and grills provided throughout this area
	Cheshire Boat Ramp and Picnic Area	<ul style="list-style-type: none"> Multiple picnic tables located throughout the area
	Lewis Center Picnic Area	<ul style="list-style-type: none"> Multiple picnic tables located throughout the area
	New Galena Boat Ramp and Picnic Area	<ul style="list-style-type: none"> Multiple picnic tables located throughout the area
	Hollenback Marina	<ul style="list-style-type: none"> Multiple picnic tables located throughout the area
	Hogback Road Access Area	<ul style="list-style-type: none"> Views of the narrowing lake and osprey nest platforms
	Visitor Center	<ul style="list-style-type: none"> Viewing deck provided at the Visitor Center
Swimming	Alum Creek Lake	<ul style="list-style-type: none"> Swimming occurs from watercraft in designated areas
	Beach	<ul style="list-style-type: none"> 3,000-foot beach for swimming
Waterskiing	Alum Creek Lake	<ul style="list-style-type: none"> Approximately 2,920 acres suitable for waterskiing

A description of the major recreational areas and facilities at the Project is presented below.

- **Visitor Center.** The Alum Creek Lake Visitor Center is located on Lewis Center Road between the beach and the Alum Creek Dam. The Visitor Center is accessed from I-71 about six miles north of the I-71/I-270 interchange to the north of the City of Columbus. It is open year-round and operated by the USACE.
- **Below Dam Area.** The Below Dam Area is managed by the USACE and provides opportunities for various recreation activities. This part of the Project is also known as the Tailwater Area or the Spillway. There is a picnic area that offers views of the dam and the outlet structure, and provides shaded picnic sites and shelters, open picnic sites, and various recreation activities including a large playground with play equipment. A kiosk with local and regional trivia is located at the far northwestern part of this area. Fishing is popular from an approximately three-foot wide sidewalk that provides easy access to the river for almost the entire length of the outfall.
- **Westerville Model Aeronautics Association Dineen Field.** This 10-acre model airplane field, located east of the picnic area, provides a control station and work tables and is open to anyone with a valid Academy of Model Aeronautics license. The Association has leased this site from the USACE since 1987 and provided funding for a 900-foot long runway, protective fencing, five concrete pad flying stations, nine pilot preparation areas with workbenches, a frequency control board, a shelter house with picnic tables, a paved parking lot with 45 parking spaces, and other appurtenances.
- **Alum Creek State Park.** The majority of the land at the Project is leased to the ODNR for public park, recreational, fish and wildlife, and forest management purposes. Within the State Park are various areas that provide a range of consumptive and non-consumptive recreational activities, as described below.
 - **Alum Creek Sailing Association Marina.** This marina, operated by the Alum Creek Sailing Association, is accessible via Lewis Center Road just north of the beach and is located on the west side of the lake. The marina has 135 boat slips that are restricted to sailboats. It also has a car and trailer gravel parking lot, concession, and a newly-constructed open-air activity center/picnic shelter that is also used for educational events related to sailing.
 - **Beach.** Alum Creek Lake offers opportunities for swimming at a 3,000-foot long beach on Lewis Center Road on the west side of the lake. The area includes three picnic areas, a concession stand terrace, soccer fields, a playground, and four sand volleyball courts.

- **Cheshire Boat Ramp and Picnic Area.** The Cheshire Boat Ramp and Picnic Area is located off Cheshire Road on the east side of the lake and is accessible via Africa Road. The facility consists of a four-lane boat ramp with courtesy docks and parking for 90 trucks with trailers and 75 additional cars, picnic tables, and charcoal grills.
- **Friends of Alum Creek Dog Park.** The Friends of Alum Creek Dog Park is on a four-acre site on the west shore of the lake near the Hollenback Boat Ramp and Marina. The dog park was built and is currently maintained by volunteers and park staff. It includes separately fenced areas for small and large dogs with beach and water access.
- **Hogback Road Access Area.** The Hogback Road Access Area is located off Hogback Road in the northeastern part of the Project. It has a parking area and provides scenic vistas and opportunities for wildlife viewing. Osprey nesting platforms have been constructed in this portion of the lake. This area is also open for hunting during fall and winter.
- **Horsemen's Day Use and Horse Camp Area.** Access to this area is by Howard Road via North Old State Road on the west side of the lake or from North Three B's & K Road on the east side of the lake. The Horsemen's Day Use and Horse Camp Area provides 30 primitive campsites with parking for trailers, tie-up areas, picnic tables and other associated appurtenances. There is a kiosk that provides camper registration, rules/regulations, and trail maps. Horseback riding is permitted at the Project on three bridle trails totaling approximately 38 miles, located primarily in the northern part of the Project. The Winterhawk Bridle Trail begins at the information kiosk. Hunter's Hollow Bridle Trail begins in the vicinity of US 36/SR 37 and proceeds north, where it joins the Winterhawk Bridle Trail just south of SR 521. The trail generally follows the contours of the lakeshore and begins to proceed south at the northernmost point of the lake to an equestrian camp/day use area located near Howard Road. The trail continues south across Howard Road, where it becomes the Maple Glen Bridle Trail, crossing US 36/SR 37, and proceeding approximately one mile south, where it shifts back to a northerly direction, ending near US 36/SR 37.
- **Howard Road Boat Ramp.** The Howard Road Boat Ramp is located in the northeastern portion of the Project and is accessible via County Road 10 on the west side or from North Three B's & K road on the east side to Howard Road. The facility consists of a two-lane boat launch ramp with courtesy docks and parking for 50 truck/trailer combinations and 20 additional cars. Fishing access is provided at this location

- **Hunting and Trapping Areas.** Although there is no designated wildlife area at the State Park, gun and archery hunting and trapping are permitted at various locations. The wooded portions of the northern part of the State Park are well-suited for hunting deer and smaller game, while the southern hunting areas, typically abandoned cropland with small areas of secondary hardwoods, are suited to rabbit and upland game hunting. Trapping is allowed in some of the areas where hunting is permitted. The ODNR holds an annual lottery for use of 20 waterfowl blinds that are located primarily on the east side of the lake, south of US 36/SR 37.
- **Kilbourne Fishing Access.** The Kilbourne Fishing Access area is located in the northernmost portion of the Project on the east side of the lake. This area has a parking lot with picnic tables and grills and provides shoreline access for fishing.
- **Lewis Center Picnic Area.** The Lewis Center Picnic Area is located in the southwestern portion of the Project to the north of the beach. This area provides opportunities for picnicking and fishing and is associated with the group camp site.
- **Mountain Biking Trails.** Mountain biking is a popular activity at Alum Creek State Park. There are two phases of trails along the eastern boundary of the lake with 14 miles of trails (Figure 3-10). Phase I is accessible from Africa Road at Lewis Center Road. One trail is south of Lewis Center Road and is designated as an easy two-mile trail; the other is located north of Lewis Center Road and is designated as a moderately difficult six-mile trail. Phase II is a six-mile trail that is designated as advanced. It is accessible from County Road 21 just north of Cheshire Road. The trails were constructed and are maintained by the Central Ohio Mountain Biking Organization.
- **New Galena Boat Ramp and Picnic Area.** The New Galena Boat Ramp, the most popular boat launch at the Project, is accessible via Africa Road on the east side of the lake. The facility consist of a four-lane boat ramp with courtesy docks and parking for 90 truck/trailer combinations and 50 additional vehicles, along with picnic tables, grills, and an additional 60 parking spaces for non-boaters using the site. During the summer months, this area is heavily utilized by tournament fishermen and pleasure boaters. The disc golf course is located in this locale, along with a seven-mile multiple purpose trail that is used for hiking, snowmobiling, and cross-country skiing.
- **Hollenback Boat Ramp and Marina.** The Hollenback Boat Ramp and Marina is accessible via County Road 10 to Hollenback Road. The boat launch facilities include a four-lane boat ramp with courtesy docks and parking for 101 truck/trailer combinations

and 25 additional vehicles. There is also a sand launch area for small boats. The Hollenback Boat Ramp and Marina is publically owned and privately operated, providing a watercraft rental service for wave runners, ski boats, pontoon boats, bass boats, simple fishing boats, rowboats, canoes, kayaks, pedal boats, and aqua cycles. This facility also offers 224 rental docks, 25 mooring balls, and 172 additional parking spaces. The marina operates a concession stand and restaurant, and sells related goods and services, including fuel. The area is open for ice skating, ice sailing, and kite skiing during the winter.

- **State Park Office.** The ODNR Division of Parks and Recreation operates a park office that is located along the western boundary of the lake on County Road 10. The office provides information for campers using both Alum Creek Lake and Delaware Lake State Parks as well as information about trails, hunting, fishing, and boating. The office vicinity offers opportunities for wildlife observation and provides benches throughout the site, as well as fishing access. There are two trails that can be accessed from this locale: The Park Office Hiking Trail and the Hollenback Hiking Trail.
- **Alum Creek State Park Campground.** The main campground is located on the west side of the lake and is bisected by Cheshire Road. There is a welcome center where campers can check in along with a nearby amphitheatre and nature center. There is a playground, tetherball court, volleyball court, and picnic tables located at this site. The campground itself has 286 campsites with electrical hookups and eight cabins that are reserved through the ODNR website. Other camping facilities are located north of the Lewis Center Picnic Area on the west side of the lake and just south of the Hollenback Boat Ramp and Marina. This area is designated for primitive group camping and organized events and includes picnic areas and a small boat launch area for canoes and kayaks.
- **Alum Creek Lake.** Management responsibilities for the lake are shared by the USACE and ODNR. Water quality is good and supports all types of water recreation. Many areas around the Lake provide scenic views. Boat access to the lake is provided at five locations: Hollenback Boat Ramp and Marina, New Galena Boat Ramp, Cheshire Boat Ramp, Howard Road Boat Ramp, and the boat ramps at the Alum Creek State Park campground. Fishing from the shoreline is provided at several points including the Lewis Center Picnic Area, Kilbourne Fishing Access, Cheshire Fishing Access, and the Below Dam Area. Bass, bluegill, crappie, walleye, saugeye, sunfish, channel catfish, and muskellunge are common sport fish. Ice fishing for crappie and saugeye is a popular winter activity.

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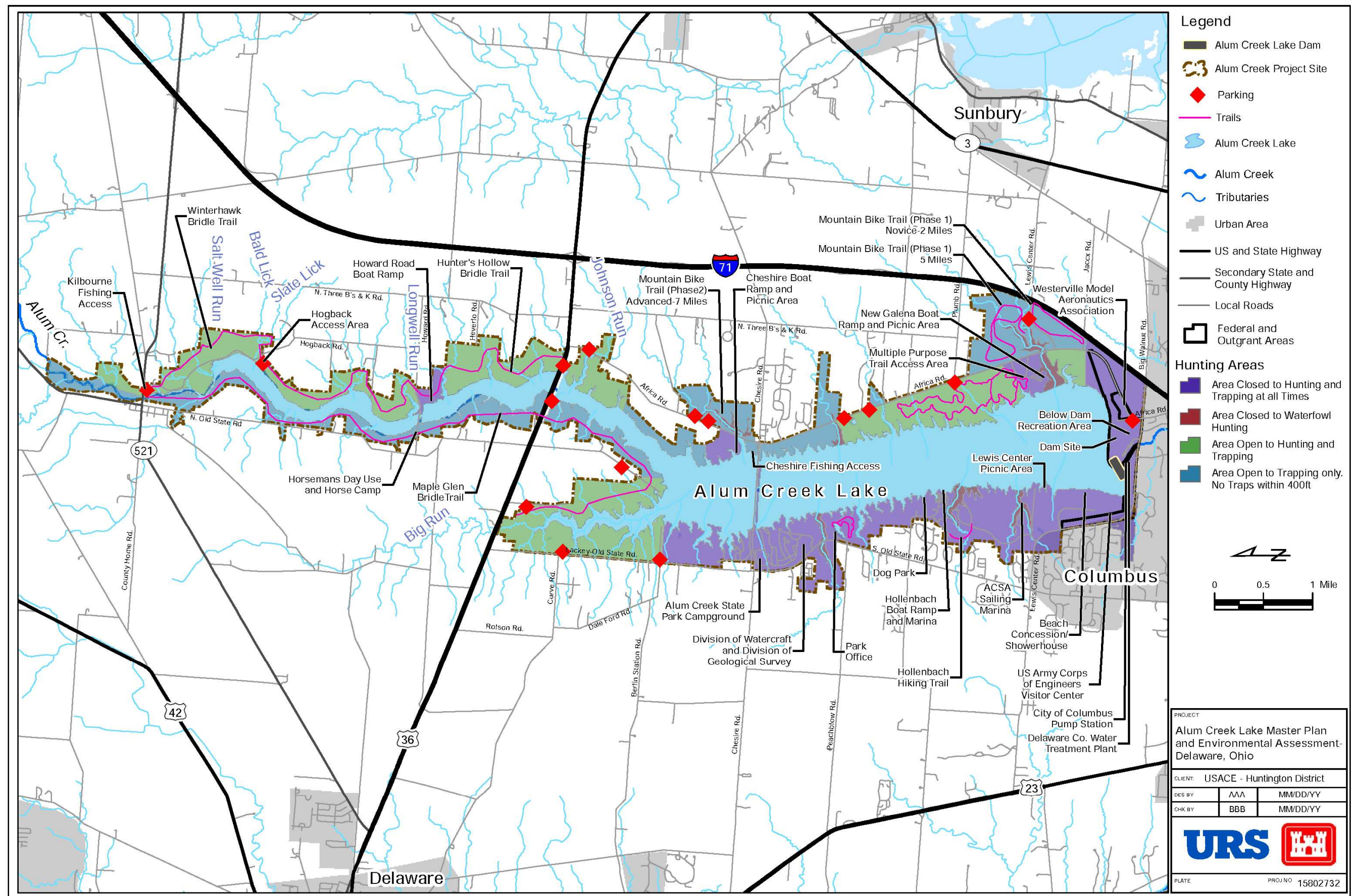


Figure 3-10: Existing Recreational Areas and Major Facilities

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3.3.5 Historic and Prehistoric Resources

A historic property, as defined by the Advisory Council on Historic Preservation, is a prehistoric or historic district, site, building, structure, or object included in or eligible for inclusion in the National Register of Historic Places (NRHP). A Historic Properties Management Plan (HPMP) was completed for the Project area in the fall of 1993 (U.S. Army Corps of Engineers, 1993). The HPMP provides a summary of the Lust Mound located near the dam site, two cemeteries, and a schoolhouse that were inundated by the reservoir. The HPMP also summarizes 155 recorded archeological sites that have been identified within the reservoir from the early 1960's through 1993. The majority of the sites were identified through surveys completed for the USACE either as initial reservoir studies or as a shoreline survey. Identified archeological sites are almost exclusively prehistoric (150) dating from the Paleoindian (10,500-8000 B.C.) through the Late Prehistoric (900-1600 A.D.) temporal periods. Only two of the sites have a historic Euro-American affiliation. The remaining three sites were not provided a cultural affiliation.

Early work in the Project area was limited to three sites of unknown cultural affiliation (33DI3, 33DI4, and 33DI5) that have been inundated, and salvage archeology for five early woodland mound sites originally thought to be in the inundation zone for the reservoir (33DI14, 33DI16, 33DI17, 33DI20, and 33DI21) as well as salvage archeology for an early woodland structure (33DI25), also originally thought to be in the inundation zone for the reservoir. Early work also recorded four prehistoric open habitation sites (33DI224, 33DI225, 33DI226 and 33DI228) and one historic site (33DI227). Three of the four prehistoric sites date from the woodland period and one is of unknown cultural affiliation. None of the sites identified through these early evaluations were listed on the NRHP. Sites recorded through salvage archeology were fully excavated in the 1960's and 1970's. Not much is known of Sites 33DI224-33DI228. These sites should be subjected to further evaluation.

A pedestrian shoreline survey was conducted of the Project area in 1993. This survey, conducted during winter pool between elevations 870' and 885', recorded 140 prehistoric archeological sites and one historic site. The sites are listed as 33DI702 through 33DI842. The recorded sites are made up of one historic cemetery, nine isolated finds, twenty-six lithic scatters, and 105 undefined sites. Forty of the sites were determined to have no potential to yield significant information and require no further work. The remaining 101 sites have potential to yield significant information and require further work to determine their NRHP eligibility.

Since the 2004 HPMP, only two known surveys have been completed within the reservoir. A 2010 survey was conducted for a proposed launch ramp (Weller & Associates, Inc., 2010). This

survey encountered one prehistoric archeological site. Site 33DI2589 is an isolated find and is not considered eligible for the NRHP. No further work is recommended. A 2011 survey was limited to the Dam Site Recreation Area (ASC Group, Inc., 2011). The survey recorded three prehistoric sites; ACR-05-FS01, which is a lithic scatter, and ACR05-FS02 and ACR05-FS03, which are isolated finds. All three sites were determined to be ineligible for the NRHP and require no further work. Sites encountered in the 2011 survey were not formally recorded on standard site forms and provided to the Ohio State Historic Preservation Office.

The only additional known cultural resource work conducted within the Project area was the 2009 emergency recovery of historic human remains from the old Cheshire Cemetery. The remains were located along the shoreline and were re-interred at the Berlin Township Cemetery.

3.3.6 Aesthetics

As described previously, the topography of the Project area is characterized as generally flat to gently rolling, with a few dissected valleys and bluffs. This terrain, in combination with the lake and forested landscape areas, creates an overall environment with opportunities for scenic vistas and view sheds. View distances range from small coves and glimpses of the lake along park and local roads to panoramic views of the lake and surrounding lands from the dam. The forests have a combination of mature growth trees and understory trees (such as hazelnut and serviceberry), creating a visually appealing environment. The vegetation of the Project offers changes in color, texture, and size that vary with topography, vegetation type, and season. Fall foliage forms a variegated collage that supports and enhances sightseeing.

Forty-six miles of shoreline, numerous picnic areas, and abundant hiking and biking trails offer opportunities to enjoy scenic vistas of the lake at many points from roads and hiking trails. Of particular interest is a scenic overlook located on the northern part of the lake on the eastern shore near Hogback Road. Photograph 3-1 illustrates the panoramic view from the overlook. Wildlife pedestals have been installed in the area to facilitate wildlife observation, specifically Osprey nesting. Scenic vistas are also available to the public from the dam.



Photograph 3-1: View from Scenic Overlook near Hogback Road

4.0 ENVIRONMENTAL IMPACTS OF PROPOSED ACTION

4.1 Physical Environment

4.1.1 Topography

4.1.1.1 No Action

The No Action Alternative would generate no impacts on Project area topography.

4.1.1.2 Proposed Action

Similar to the No Action Alternative, the Proposed Action Alternative would have no adverse effects on topography.

4.1.2 Geology and Mineral Resources

4.1.2.1 No Action

Under the No Action Alternative, no new proposed facilities or measures recommended in the 2011 Master Plan Update would be implemented. Any leasing of minerals owned by the Federal Government would continue under the control of the Bureau of Land Management (BLM). Because the demand for oil and/or natural gas is increasing, there is potential for new extraction operations for minerals in the Project area. Oil and/or natural gas are leasable minerals governed by the Mineral Leasing Act of 1920 (30 U.S.C. §§ 181-263) and the Mineral Materials Act of 1947 (30 U.S.C. §§ 351 et seq.). At the present time, there are no proposals for mineral extraction or mineral exploration on Project lands.

4.1.2.2 Proposed Action

No impacts on geology or mineral resources would occur under the Proposed Action. Geotechnical evaluations would be performed to determine any risk of construction of recommended actions in areas of geologic concern, such as highly erodible or unstable slopes. However, it does not appear that the proposed recommendations in the Master Plan Update would have any adverse effects on areas where geological concerns may exist and, consequently, pose no risk of impact on geological resources. None of the Project recommendations would have any effect on possible future leasing of mineral rights or mineral extraction.

4.1.3 Soils

4.1.3.1 No Action

Under the No Action Alternative, no new proposed facilities or measures recommended in the 2011 Master Plan Update would be implemented. Total Project visitation is expected to increase, and certain facilities within the Project may see even greater usage due to improvements implemented by the USACE that are not part of the Master Plan Update. The USACE and other resource agencies responsible for outgrants would monitor any areas that are susceptible to erosion from higher recreational usage, as well as from users accessing new or less congested areas of the Project (potentially resulting in the creation of social trails, trampling of vegetation on the edge of existing campgrounds, or overuse of existing trails). As a result, the potential for increased erosion would be minimized. To further minimize adverse impacts on soils, the USACE and other resource agencies responsible for outgrants would implement protective measures, such as closing off eroded areas and installing structural erosion control measures as warranted.

4.1.3.2 Proposed Action

Implementation of Master Plan Update recommendations would provide additional Project amenities that could generate an increase in visitation (e.g., additional recreational vehicle campsites, group picnic shelters, and pedestrian/bikeway paths). The USACE would monitor areas that are susceptible to erosion from increased usage. To minimize potential adverse impacts on soils, the USACE would implement protective measures, such as closing off eroded areas and installing erosion controls as needed in impacted areas.

The vast majority of Project lands are flat or gently rolling with minor terrain relief (Figure 3-1). Recommendations from the Resource Plan that would disturb soils, such as providing pedestrian/bikeway path improvements, constructing a group picnic shelter, and adding parking, would involve construction on relatively flat ground with minimal possibility for erosion. Consequently, it is not expected that erosion would be a major consideration associated with construction of the proposed recommendations. Areas where slopes are less than 15 percent and have less potential for erosion than steeper areas are more suitable for recreational use. The areas proposed for the construction of facilities (i.e., picnic shelters, camping sites, and parking areas) would occur on slopes less than 15 percent and close to existing development. The Master Plan Update recommendations would not involve major new construction in areas of steep slope that could result in high erosion potential.

Implementation of temporary erosion and sediment control Best Management Practices (BMPs) during construction (e.g., mulching bare areas and installing a silt fence) along with permanent BMPs post-construction (e.g., managing the flow of stormwater runoff from impervious areas, such as buildings and parking lots, and establishing permanent vegetation buffers) would occur for all proposed activities that would disturb the ground surface. Similar to the situation under the No Action Alternative, for construction activities that would disturb more than one acre, the USACE would secure approval under the National Pollutant Discharge Elimination System by applying for a General Permit for Stormwater Discharges Associated with Construction Activities from the OEPA and would develop construction site erosion control and stormwater management plans as required. To more thoroughly evaluate impacts possibly associated with any recommendation planned for implementation, consideration would be given to soil suitability, slope, and potential for geologic instability during site-specific project planning. Site-specific mitigation measures would be determined prior to construction and implemented as needed.

4.1.4 Land Use/Land Cover

4.1.4.1 No Action

There would be no substantial impacts on land use/land cover under the No Action Alternative. Minor maintenance activities and other USACE actions not associated with the proposed Master Plan Update recommendations would not have noticeable impacts, either individually or cumulatively, on land use and land cover.

4.1.4.2 Proposed Action

None of the recommendations in the Master Plan Update would involve construction of major new facilities that could have substantial effects on land cover or land use. Many of the recommendations would involve some level of land clearing, grading, and other improvements that would change land use and land cover characteristics, such as adding parking or modifying parking at several sites, providing new trails and pedestrian/bikeway connections, and constructing additional recreational vehicle campsites in presently undeveloped areas adjacent to existing campgrounds. However, these changes would affect relatively small areas of land and would not have major adverse effects on land use or the land cover characteristics of the Project.

4.1.5 Water Resources and Quality

4.1.5.1 No Action

Under the No Action Alternative, no new proposed facilities or measures recommended in the 2011 Master Plan Update would be implemented. With the anticipated increase in visitation, the USACE would monitor areas that are susceptible to erosion from increased usage and people trying to access new or less congested areas (potentially resulting in the development of social trails, trampling of vegetation on the edges of existing campgrounds, or overuse of existing trails); therefore, the potential for increased sedimentation of the lake would be minimal. The USACE would mitigate any adverse impacts by closing off eroded areas and implementing erosion and sediment controls as needed.

Environmental impacts of operations at USACE facilities and projects are monitored through annual assessments performed as part of the Environmental Review Guide for Operations (ERGO) system. The comprehensive assessments provide an evaluation of compliance with all applicable federal, state, and local environmental laws and regulations by identifying environmental problems and rating these problems as minor, major, or significant, with associated levels of corrective action. Issues related to solid waste handling, erosion control, toxic and hazardous waste handling and management, and other considerations affecting water resources and quality are evaluated. Under No Action, the ERGO system would continue to insure that impacts of Project operations on water resources and quality would be identified early and corrected.

4.1.5.2 Proposed Action

Under the Proposed Action, there would be minimal increases in impervious surface area associated with the recommended actions, so additional stormwater runoff that could potentially affect erosion and increased sedimentation of waterways would be negligible. The recommendations for expanded or modified parking at some sites, coupled with proposed new structures such as group picnic shelters and restroom facilities, would, in combination, add only a small amount of additional impervious area and increase stormwater flows only minimally. The risk of water pollution from spilled or water-transported materials would also be minimal.

Adverse short-term impacts on surface water quality could occur from sedimentation that is the result of ground disturbances during construction activities, especially in construction areas close to the shoreline or water bodies. Implementing erosion and sediment control BMPs during construction and implementing permanent stormwater runoff controls would minimize potential

adverse impacts. For example, disturbed or bare areas remaining after construction would be vegetated to reduce the potential for erosion.

Adverse short- and long-term impacts on water quality may also impact other resources, such as recreation (fishing and swimming), water treatment systems, aquatic biological resources, and terrestrial wildlife. Impacts on water quality may occur from trash/debris entering water bodies, sewage, spills, and leaks of contaminants from both land- and water-based vehicles. Mitigation, such as establishing limits for motorboat carrying capacity, providing adequate trash collection, and including stormwater runoff measures during the design of redeveloped or new facilities, would not only minimize adverse water quality impacts, but potentially improve water quality compared to existing conditions. As described above for the No Action Alternative, the USACE ERGO system provides an annual assessment of Project compliance with environmental requirements. Through this system, environmental issues at the Project are identified and corrective actions planned. As a result, ERGO assessments will minimize any potential adverse environmental effects of the Master Plan Update recommendations on water resources and quality. The recommendations in the Master Plan Update for adding new or upgraded sewage facilities at major campgrounds would have positive impacts on both surface water and groundwater quality by providing upgraded treatment of waste.

Localized turbidity in the nearshore lake environment associated with improvements, such as upgrading the breakwater and boat docks at the Hollenback Marina, along with constructing a breakwater and reconfiguring boat ramps at the Cheshire Boat Ramp, may create temporary impacts on water quality. Impacts would be limited to the vicinity of the work with implementation of mitigation measures to minimize turbidity. These measures may include utilizing construction techniques that minimize disturbance to submerged vegetation, limiting construction equipment to the banks of the shore to the extent practicable, using a sediment/silt curtain if warranted, and implementing spill prevention and control measures for vehicles operating in or near the water. Other mitigation measures may include limiting the use of wood preservatives and treated lumber for dock construction. Wood preservatives, such as creosote, pentachlorophenols, and chromated-copper-arsenate treated lumber, may result in pollutants leaching into the water over time.

4.1.6 Floodplains

4.1.6.1 No Action

Under the No Action Alternative, new construction not stemming directly from the Master Plan Update could occur within Project areas subject to flooding; however, the USACE would follow existing guidance regarding development within a floodplain. The USACE publication EM

1110-1-400 (U.S. Army Corps of Engineers, 2004), Sections 2.2.1 and 5.2.2 regarding seasonal fluctuations, state that seasonal fluctuations in water levels shall be taken into consideration when designing and developing lake and riverside facilities to avoid the placement of facilities in hazardous or high maintenance areas, and that a five-year flood frequency is a good general guideline when planning lakeside development.

4.1.6.2 Proposed Action

Most of the proposed Master Plan Update recommendations would involve minor changes and enhancements of existing Project facilities (e.g., additional RV campsite construction, expansion and modification of parking, and modification of existing boat ramps at the Cheshire Boat Ramp and Howard Road Boat Ramp). These improvements would have minimal effects on flooding and flood levels. The USACE would follow existing agency guidance described under the No Action Alternative regarding development within flood-prone areas. The USACE would ensure that its actions comply with USACE's guidance on development within a floodplain (EM 1110-1-400 [U.S. Army Corps of Engineers, 2004]), EO 11988 (Floodplain Management), and USACE's guidance on implementation of EO 11988 (ER 1165-2-26 [U.S. Army Corps of Engineers, 1984]); and would implement BMPs such as secondary containment and/or elevation of hazardous materials above base flood elevations to the maximum extent possible. Additionally, USACE and the State would ensure the safety of visitors by monitoring flood levels at areas and facilities used by the public and taking actions such as closing facilities as necessary. All USACE actions would be in compliance with the provisions of EO 11988.

4.1.7 Air Quality

4.1.7.1 No Action

Under the No Action Alternative, construction of projects not directly associated with the recommendations of the Master Plan Update could result in short-term, highly localized, but still minor, impacts on air quality from fugitive dust and construction vehicle emissions. To reduce temporary impacts on air quality from fugitive dust, the construction areas would be watered down when necessary to minimize airborne particulate matter. Emissions from fuel-burning internal combustion engines (e.g., heavy equipment and earthmoving machinery) could temporarily increase the levels of some pollutants, but these increases would be negligible.

4.1.7.2 Proposed Action

Impacts on air quality and mitigation measures to reduce potential impacts would be the same as described under the No Action Alternative. None of the recommendations in the Master Plan

Update would generate any substantial impacts on ambient air quality during or following construction, nor generate any violations of State and National Ambient Air Quality Standards. Recommendations that would enhance traffic flow and reduce congestion, such as providing additional parking, separating day use parking from boat ramp parking, and constructing improved, more efficient boat ramps at the Cheshire Boat Ramp and Howard Road Boat Ramp, would reduce queuing and delays with a commensurate reduction in tailpipe emissions, which would benefit air quality conditions in the Project locale.

4.1.8 Climate

4.1.8.1 No Action

The No Action Alternative would have no effects of any kind on existing climate conditions.

4.1.8.2 Proposed Action

Similar to the No Action Alternative, implementation of the Proposed Action would not result in any impacts on climate.

4.1.9 Noise

4.1.9.1 No Action

Construction noise resulting from other development activities not associated with the 2011 Master Plan Update could generate temporary noise impacts on visitors, employees, and wildlife. In most cases, noise would result in temporary nuisance impacts, potentially affecting the overall recreation experience of Project visitors. To reduce noise impacts, construction activities should be confined to daylight hours during the normal work week. If deemed appropriate, construction specifications can require contractors to provide muffling of construction equipment. In general, increased use of certain areas, due to improvements, would create additional noise above existing conditions due to the associated increase in human activities. Seasonal noise from boats on the lake could have a negative impact on wildlife, day users, and lakeside campers. However, boating-related noise is a consequence of the recreational purpose of the Project and would be expected to result in only minor impacts on wildlife and visitors.

4.1.9.2 Proposed Action

Impacts from noise and mitigation measures to reduce potential impacts would be the same for the Proposed Action as described under the No Action Alternative. Implementation of the Master Plan Update recommendations may increase use of certain areas of the Project with a

commensurate increase in vehicular and motorboat noise; however, as described above, such noise would be experienced by Project users primarily as a temporary and intermittent nuisance, given the rural nature of the area and the existing low ambient noise level. No major adverse noise impacts would result from implementation of any or all of the Master Plan Update recommendations.

4.2 Biological Environment

4.2.1 Vegetation

4.2.1.1 No Action

Under the No Action Alternative, ODNR and the USACE would continue to monitor, manage, and protect vegetative resources in the Project area on an as-needed basis. Littering and trampling of vegetation could occur from informal use areas, especially with any anticipated increase in visitor usage. The USACE and ODNR would monitor for impacts on vegetation and implement restrictions or restoration as needed while continuing regular maintenance activities for vegetation control.

An area of concern is the introduction and spread of invasive species, which are already evident in parts of the Project. Under the No Action Alternative, there would be no coordinated plan to control invasive species, increasing the possibility over time that such species would adversely impact existing habitat conditions by out-competing native species.

In addition, under No Action, the baseline study of significant vegetative resources would not be performed. Without this study, information on the location, size, and condition of resources such as bottomland hardwoods and wetlands would not be obtained, and no active plan would be implemented to monitor conditions of these resources and manage threats that could jeopardize their long-term health and viability within the Project area.

4.2.1.2 Proposed Action

Some project recommendations would generate minor adverse impacts on vegetation as a result of clearing for construction purposes. This would include adding new cabins and recreational vehicle campsites at the State Park Campground, as well as additional parking adjoining existing parking lots serving several Project facilities. Campsites would be designed carefully and trees and understory vegetation would be selectively cleared to minimize impacts and preserve the rustic character and aesthetics of the camp spaces. Minimal clearing of vegetation would be needed for creation of new paths at several locations, including a pedestrian/bike path in the

Below Dam Recreation Area, a path connecting parking to the Dinneen Field, and a path from the Beach to the Visitor Center Trail.

Recommendations in the 2011 Master Plan Update that would have a beneficial effect on Project area vegetation include creation and implementation of an invasive species management plan, as well as completion of a baseline study to identify sensitive or rare habitats within the Project. These recommendations would generate major positive impacts on vegetation resources in the Project. The invasive species management plan would provide the basis for a concerted effort to control intrusion and spread of unwanted plant species and limit their impacts on native vegetation throughout the Project. An active invasive species management plan would support the long-term health of the existing ecosystems occurring in the Project, with beneficial long-term effects on numerous Project attributes including scenic quality, wildlife populations, and recreational activities that depend on wildlife.

A baseline study of significant vegetative communities is recommended to locate such sensitive habitats as old growth trees, bottomland hardwoods, wetlands, and any hitherto unknown rare or threatened species. Bottomland hardwood habitats are becoming increasingly scarce and more valuable from an ecological perspective. Because bottomland hardwood habitats support a variety of plant and animal species that can adapt to both flood conditions and dry periods and also support wildlife that does not thrive in other environments, this habitat warrants protection. Management of these areas would yield a high-quality habitat for wildlife that would also be beneficial for many recreational activities, including wildlife viewing. The study would also include acquiring data on wetlands throughout the Project. Completing a baseline study of these resources would be a first step to providing enhanced protection for rare and valuable habitat and for providing the basis for long-term monitoring of changes in resource conditions to guide proactive management of these resources.

4.2.2 Wetlands

4.2.2.1 No Action

Under the No Action Alternative, the USACE and ODNR would continue to preserve and enhance wetland resources within the Alum Creek Lake Project area as mandated by EO 11990 and the 1984 Master Plan.

4.2.2.2 Proposed Action

At this programmatic stage of the planning process, it does not appear that the proposed Master Plan Update recommendations would adversely impact any wetland areas within the Project

based on NWI data. When specific recommendations are ready for implementation, additional site specific surveys for potential jurisdictional wetlands will be undertaken in all areas that could be impacted by the proposed undertaking. One of the recommendations in the 2011 Master Plan Update would involve conducting a baseline survey of significant natural resources, habitats, and communities in the Project, as mentioned above in Section 4.2.1.2. This survey would enhance data on the location, size, and characteristics of wetlands in the Project, providing more reliable data than currently exists. This would support future conservation and management efforts to protect and enhance wetland resources, which would enhance wildlife resources, as well as long-term recreational opportunities for wildlife viewing, nature education, nature photography, and hunting.

The USACE would obtain all appropriate permits as required by Section 401 of the CWA for construction that would impact any waters of the US. The USACE would require other agencies and developers to obtain CWA Section 404 permits prior to implementation of projects that would result in impacts on wetlands.

4.2.3 Terrestrial Wildlife

4.2.3.1 No Action

Under the No Action Alternative, ODNR and the USACE would continue to monitor and manage wildlife in accordance with the 1984 Master Plan and applicable conditions of the ODNR lease. Wildlife viewing, birding, and opportunities to hunt game in portions of the Project area would continue.

4.2.3.2 Proposed Action

The recommended actions proposed in the 2011 Master Plan Update would generate negligible adverse impacts on terrestrial wildlife. There may be some minor amount of terrestrial habitat loss with campground and parking expansion into previously undeveloped areas, but the value of this habitat may be limited due to proximity to frequent human use areas, so impacts are expected to be minor.

4.2.4 Aquatic Life

4.2.4.1 No Action

The No Action Alternative would have no adverse effect on fisheries and other aquatic wildlife resources. ODNR and the USACE would continue to monitor and manage aquatic resources in

accordance with the 1984 Master Plan and current programs. ODNR would continue to annually stock the lake with recreationally valuable fish species.

4.2.4.2 Proposed Action

Construction activities in the water (e.g., upgraded docks at the Hollenback Marina, reconstruction of the breakwater at Hollenback Marina, and improvements to the Cheshire and Howard Road Boat Ramps) could result in short-term adverse impacts on the aquatic environment. Additionally, excess deposition of sediment as a result of stormwater runoff during land-based construction could adversely affect aquatic life including the food chain, spawning and rearing habitat, in-stream cover, water temperature extremes, and other structural and functional components. Sedimentation from construction in areas adjacent to water bodies would be minimized by implementing erosion and sediment control measures. With the controls available for erosion and sediment control, impacts on water quality and aquatic life would be minor, short-term, and localized.

Increased recreational use of some areas or facilities within the Project resulting from improvements in these areas or upgraded facilities could also generate additional impacts. For example, higher motorboat traffic on the lake could increase noise disturbances, as well as the potential for spills and/or leaks of pollutants. Higher numbers of recreational users in certain areas of the Project could also increase the volume of trash entering water bodies, as well as stream bank or lakeside habitat destruction from overuse of some areas that could result in sedimentation or loss of riparian habitat. Effective management of these activities should limit and control the adverse effects on aquatic resources resulting from increased usage of specific areas of the Project.

Proposed improvements, such as implementing fish attractors at dedicated shoreline fishing access locations, could provide long term beneficial impacts to aquatic life.

4.2.5 Threatened, Endangered and Protected Species

4.2.5.1 No Action

Under the No Action Alternatives, USACE actions would continue to be controlled by Federal and State endangered species regulations and internal USACE program requirements.

4.2.5.2 Proposed Action

At the time that any of the Resource Plan recommendations are planned for implementation, the USACE will take actions, in compliance with Federal and State regulations, to ensure that the

recommendations will not adversely affect any threatened and endangered species or any critical habitat that may have been established in or near areas potentially affected by the proposed undertakings. Such actions may include surveys of the potential area of impact to determine whether endangered or threatened species may occur in these areas, either seasonally or throughout the year. If found, alternatives to the proposed undertakings that would avoid adverse impacts on these species would be evaluated, and management requirements for these species, including ecological requirements and life histories, would be evaluated to identify possible mitigation measures. These actions would be described in supplementary NEPA documentation prepared subsequent to this PEA that would address the impacts of the specific Master Plan Update recommendations and would be made available for public and jurisdictional agency review and comment prior to implementation.

4.3 Socioeconomic Environment

4.3.1 Population and Employment

4.3.1.1 No Action

The No Action Alternative is not anticipated to generate any consequential impacts, either positive or negative, on local or regional population, employment, or income.

4.3.1.2 Proposed Action

The Proposed Action is not expected to have any effect on population. The potential construction of recreational facilities could produce short-term economic benefits from temporary construction employment; however, these effects are not expected to be substantial.

4.3.2 Environmental Justice

4.3.2.1 No Action

Existing programs and operation and maintenance activities that would continue under the No Action Alternative, as well as new facilities and/or activities not identified in the 1984 Master Plan Update that may be constructed or implemented on a case-by-case basis, would likely generate no disproportionate impacts on environmental justice populations. The majority of these actions would be implemented within the boundaries of the Project and at a distance from local population centers. As a result, any environmental justice populations that may occur in the Project vicinity would not be directly impacted by these actions, and indirect impacts would be inconsequential.

4.3.2.2 Proposed Action

As discussed previously in Section 3.3.2, the use of 2000 Census data to determine the possible presence of minority and/or low income populations in areas that may be affected by the proposed Master Plan Update recommendations is questionable given the high growth rate and other population changes that have occurred in the Project vicinity over the past decade, particularly in Delaware County. More specific evaluations of potential environmental justice impacts that will be required as part of any future supplementary project-specific NEPA documentation should be based on the more accurate data from the 2010 Census. At the time that specific actions are planned for implementation and it is determined that additional NEPA documentation will be needed for these actions, 2010 Census block data should be available for use in determining whether potential minority and low income populations may exist in areas that could be impacted by the proposed actions. These data can be used to determine if the proposed actions are likely to generate adverse impacts on these populations and whether these impacts are disproportionate.

The locations within the Project where Resource Plan recommendations would be implemented are generally removed from populated areas, with the exception of the recommendation to establish improved bikeway and pedestrian connectivity between the Project and surrounding communities. As a result, local residents would be unlikely to experience direct impacts from implementing most of the Master Plan Update recommendations, whether disproportionate or otherwise. Increased connectivity could generate beneficial impacts on residents in surrounding communities by improving access to Project resources and amenities. However, if the Master Plan Update recommendations result in increased visitation to the Project, local residents may be indirectly impacted, negatively by increased traffic and positively by increased revenue, from the greater number of Project recreational users who may buy supplies or accommodations locally. The direct and indirect impacts resulting from the proposed Resource Plan recommendations on local communities are not expected to be substantial, and it is unlikely that such impacts could likely be considered as disproportionate if environmental justice populations were determined to exist in any affected community. Final determination will be made when the impacts of individual recommendations planned for implementation are analyzed as part of any supplementary NEPA evaluations that may be required for these actions.

4.3.3 Transportation and Traffic

4.3.3.1 No Action

Certain areas of the Project are currently experiencing some congestion, especially during peak recreational periods and holidays. As visitor use increases, the ability of the existing facilities to handle the increase in traffic would decline, resulting in increased traffic congestion.

4.3.3.2 Proposed Action

Increased traffic from construction and worker vehicles during construction could result in minor temporary impacts on traffic and transportation, but in most areas the impacts would likely be negligible. The expansion and reconfiguration of parking areas and boat ramps as proposed at the Hollenback, New Galena, Cheshire, and Howard Road Boat Ramps would have long-term beneficial impacts on vehicular traffic flow, likely reducing congestion in these areas. Proposed improvements to the intersection at Lewis Center Road and the Below Dam Recreation Area access road will also provide long-term beneficial impacts to traffic flow.

Pedestrian/bikeway improvements and enhanced connectivity to surrounding neighborhoods may also result in some reduction in vehicular use and demand for parking, providing beneficial impacts to the transportation network.

4.3.4 Recreation

4.3.4.1 No Action

The provision of recreational facilities and services would continue under the No Action Alternative, but the 1984 Master Plan would not accurately reflect the current status of Project facilities. New improvements to recreational and support facilities could be developed on a project-by-project basis, but these improvements would represent a piecemeal and potentially inefficient approach to fulfilling the authorized purposes of the Project in the long term.

4.3.4.2 Proposed Action

Recreational needs of the public would be better accommodated through implementation of a comprehensive plan over the long term as represented by the 2011 Master Plan Update. The Proposed Action is based on a review of the existing facilities, resource suitability, trends and forecasts of future demand, and discussions with stakeholders. There would be beneficial impacts on recreation, not only from modernizing and upgrading existing facilities (e.g., expanding facilities for fishing and boating), but also from increasing the management of natural

resources through some of the Resource Plan recommendations. Such recommendations include baseline studies of significant natural resources and development of an invasive species control plan, all of which could improve the health of local habitats and encourage wildlife diversity. Enhancing the camping experience with modern, upgraded facilities would also complement the existing campsites presently available.

4.3.5 Historic and Prehistoric Resources

4.3.5.1 No Action

Under this alternative, actions by the USACE that are not associated with the 2011 Master Plan Update recommendations would be guided by the 1993 HPMP, as well as the other historic/archaeological resource investigations previously discussed in Section 3.3.5.

Considerable information is thus available to minimize adverse impacts on cultural resources of any USACE activities. The District Archaeologist would determine the need to avoid, minimize, or mitigate impacts on cultural resources in keeping with the determinations of NRHP eligibility or the need for further investigation. The District Archaeologist would also determine the need for cultural resource surveys for any unsurveyed areas of the Project where actions are proposed and recommend appropriate courses of action. Activities that may affect cultural resources would be coordinated with the Ohio Historic Preservation Officer under the requirements of the Advisory Council on Historic Preservation.

4.3.5.2 Proposed Action

Several of the cultural resources discovered during previous surveys of the Project have been evaluated regarding eligibility for nomination to the NRHP, although numerous sites along the shoreline have not. In addition, some areas of the Project remain unsurveyed for cultural resources. At the time that specific Master Plan Update recommendations are ready for implementation, actions in areas not previously surveyed will require coordination with the District Archaeologist to determine if a cultural resource survey is required, whether or not prepared as part of subsequent NEPA documentation. Cultural resource research, evaluation, and reporting must comply with all applicable Federal and State laws and regulations.

4.3.6 Aesthetics

4.3.6.1 No Action

Under the No Action Alternative, aesthetics in the Project area would remain essentially unaffected. Panoramic views of the lake and surrounding terrain would remain available to

visitors from the dam site, in the tailwater area, and along portions of the lake shoreline, such as the Hogback Road Access Area.

4.3.6.2 Proposed Action

Implementation of the Proposed Action would have no substantial effects on aesthetic conditions within the Project.

4.4 Cumulative Impacts

4.4.1 Past and Present Actions

Cumulative impacts would result from the incremental impact of the Proposed Action added to impacts from other past, present, or reasonably foreseeable future actions in the local area. Geographical boundaries for this discussion of cumulative impacts are the Project area and Delaware County. Temporal boundaries are the reservoir impoundment date (1975) to 50 years into the future (2025).

4.4.2 Reasonably Foreseeable Future Actions

Master Plan Update for Delaware Lake Project

Concurrent with preparation of the Master Plan Update for the Alum Creek Lake Project, a Master Plan Update is being prepared for the nearby Delaware Lake Project. The resource plan for this Master Plan Update includes a list of recommendations for upgrading, evaluating, and protecting Project resources and enhancing the authorized purposes of Delaware Lake. Some of the recommended structural improvements include: reconstructing the Delaware State Park Southwest Marina, which includes reconfiguring boat ramps, upgrading existing docks to accommodate larger watercraft, and adding courtesy docks at the boat ramp; developing additional RV campsites and building additional cabins; upgrading potable water and sanitary sewer service and restrooms at several locations; relocating the existing shooting range; implementing an invasive species control plan; and a number of smaller improvements such as upgrading picnic facilities, constructing group shelters, and expanding and/or reconfiguring parking areas.

Major Utility Corridors

The 2011 Master Plan Update discusses the possibility of establishing major utility corridors traversing Project lands to accommodate the future development of linear infrastructure, such as gas and oil pipelines and electrical transmission and distribution lines. Criteria were presented

for establishing potential utility corridors that would minimize adverse impacts by avoiding sensitive Project resources such as wetlands and known historic and archaeological sites, as well as popular and heavily-utilized recreational areas. However, there are no specific plans or proposals for such developments across the Project. The discussion in the Master Plan Update is intended to address planning-level considerations to anticipate possible future actions in regard to establishing utility corridors. At this time, there are no reasonably foreseeable projects of this type that are planned for the time period of this cumulative impacts analysis; consequently, the establishment of utility corridors across Project lands was not considered in this analysis.

General Development Pressures

The greatest driver of impacts on environmental resources in the geographical area of interest is residential and commercial development. As discussed in Section 4 of this Master Plan Update, there is expected to be a 23 percent increase in population in the primary area of influence between 2000 and 2020 and a 24 percent increase in population in the secondary area of influence over the same time period. Over the past decade, Delaware County has seen tremendous growth, primarily as an offshoot of the growth of the greater Columbus metropolitan area. The rapid growth of Delaware County has resulted in conversion of agricultural lands and woodlands into residential and commercial developments, with associated impacts on a range of environmental amenities including loss of wetlands and terrestrial habitat for wildlife, increased traffic congestion, reduction in air quality, and higher ambient noise levels. These development trends are expected to continue into the foreseeable future and will be the principal driver of adverse impacts on the environmental attributes of the area of concern.

For purposes of this PEA, the impacts of regional residential and commercial development were not quantified. However, if cumulative impacts are deemed to be a significant consideration in the preparation of any supplementary NEPA documentation for specific Master Plan Update actions, these trends will have to be investigated in greater detail to attempt to identify the magnitude and extent of adverse impacts on environmental factors.

4.4.3 Effects

The recommendations in the Resource Plans for both Delaware Lake and Alum Creek Lake Projects could, cumulatively, generate some minimal adverse effects on terrestrial and aquatic habitats, but it is anticipated that these cumulative impacts, individually and in combination, would be inconsequential when compared to the likely impacts stemming from the continuing conversion of undeveloped lands into new residences and businesses in both the Primary and Secondary Areas of Influence. This conversion has adversely impacted, and will likely continue to adversely impact, wetland resources, terrestrial and aquatic habitat and wildlife, air quality,

ambient noise levels, and traffic conditions on the regional transportation network. The potential adverse cumulative impacts of the 2011 Master Plan Update Resource Plan recommendations for the Project on these environmental resources and considerations, evaluated in combination with the expected impacts of increased development throughout the area of interest, would not be substantially different than the impacts of the development activities considered separately.

As the area around both Delaware Lake and Alum Creek Lake experiences increased development in the future, terrestrial resources surrounding the reservoir will become increasingly limited. With the loss of vegetated land area outside project boundaries, wildlife is likely to be concentrated in the remaining forested lands. In addition, more pressure will be placed on the public lands for the facilities and activities that are provided. Because visitation to the Alum Creek Lake and Delaware Lake Projects is expected to increase, demands for recreational facilities will also continue to increase. Facilities will need continual repair and upgrade to meet visitor expectations. In addition, there may be conflicting demands for recreational opportunities on the Lakes and Project lands. Although the continued request for uses of Project lands by various interests will also add more demands on the limited Project lands and waters, the USACE would not allow development to exceed the carrying capacity of the Project's environmental resources; development would be limited to a sustainable level. Implementation of the Proposed Action (implementation of the Master Plan Update) would provide a tool for the resource staff of Alum Creek Lake to ensure that natural resources and Project facilities are being used to the greatest extent possible without degrading resources. The same situation will exist at the Delaware Lake Project. Designating areas for existing and future outgrants of Project lands would limit the extent and severity of potential impacts at each Project and the cumulative impacts of Plan implementation at both Projects.

5.0 SUMMARY OF MITIGATION MEASURES AND AGENCY CONSULTATION REQUIREMENTS

The following measures would be implemented, as appropriate, to avoid or minimize adverse impacts on resources:

- Instituting erosion and sediment control BMPs for all projects involving ground disturbance and obtaining an NPDES General Permit for Stormwater Discharges Associated with Construction Activities from the OEPA for any project that would disturb greater than one acre of ground;
- Obtaining Section 401 Water Quality Certification from OEPA for work in waters of the U.S. including the near shore environment of the lake;
- Avoiding lakeside development in hazardous or high maintenance areas of the floodplain and areas subject to the five-year flood frequency when planning lakeside development, and notifying the public under EO 11988 for construction within the 100-year floodplain;
- Surveying for the presence of federally listed species under Section 7 of the Endangered Species Act where potential habitat may occur or as directed by the USFWS prior to construction; and
- Surveying for the presence of cultural resources as needed prior to construction in the specific areas that may be impacted.

In addition to the measures stated above, the USACE would consult with the following agencies prior to implementation of Resource Plan recommendations:

- USFWS under Section 7 of the Endangered Species Act; and
- Ohio Historic Preservation Office under Section 106 of the National Historic Preservation Act, as well as other consulting parties, including Native American Tribes, as appropriate.

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6.0 PUBLIC INVOLVEMENT

A public meeting and three stakeholder meetings were held on 11 August 2009 during the scoping phase of the Master Plan. The scoping process is used to invite public participation, identify issues, and obtain public comment in the Master Plan formulation process. The public meeting conducted at the USACE Alum Creek Lake Visitor's Center contributed to understanding of key project issues and needs, as well as formulating the resource objectives presented in the Master Plan Update. Two stakeholder meetings were also held on 11 August 2009 at the Alum Creek Lake Visitor's Center. The results of the three meetings are summarized in Chapter 2.0 of the Master Plan Update and a detailed summary of comments provided by the public and stakeholders is presented in Appendix C of the Master Plan Update.

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7.0 REFERENCES

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Appendix A:

Alum Creek Lake Master Plan Update

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See Alum Creek Lake Master Plan Update August 2011

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Appendix B:
Project Correspondence
And
Agency Coordination

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July 1, 2010

U.S. Fish and Wildlife Service
Ohio Ecological Services Field Office
Attn: Dr. Mary Knapp, Field Supervisor
4625 Morse Road, Suite 104
Columbus, OH 43230

**RE: Notification of Preparation of Programmatic Environmental Assessments and Request for Initial Project Review
Master Plan Updates for Delaware Lake and Alum Creek Lake
U.S. Army Corps of Engineers, Huntington District**

Dear Dr. Knapp:

The U.S. Army Corps of Engineers (USACE) Huntington District has retained URS Corporation to update the Master Plans for Delaware Lake and Alum Creek Lake near Delaware, Ohio. As part of the Master Plan Updates, programmatic Environmental Assessments (EAs) will be prepared to evaluate the potential environmental impacts from the proposed actions. A separate Master Plan Update and programmatic EA are being developed for each site. The EAs are being prepared to satisfy USACE's obligations under the National Environmental Policy Act of 1969 and will also serve as a means for ensuring compliance with a variety of other Federal statutes, including, but not limited to, the Endangered Species Act, National Historic Preservation Act, Fish and Wildlife Coordination Act, and the Clean Water Act. The last Master Plan Update for Delaware Lake was prepared in 1985; for Alum Creek Lake, the last Master Plan Update was prepared in 1984.

The Master Plan Update study objectives for both Delaware Lake and Alum Creek Lake include formulation of programs and measures to accomplish the following:

- Enhance the recreational experience of park visitors;
- Minimize impacts of recreational use on project resources;
- Enhance and conserve wildlife habitat and promote conservation education;
- Identify significant and/or environmentally sensitive resources for preservation;
- Delineate and map culturally and historically important site resources;
- Develop natural resource inventories;
- Identify acceptable easement alignments through USACE property;
- Evaluate potential impacts of invasive species on project resources;
- Evaluate suitability of project lands for recreational hunting and trapping;
- Evaluate the potential for a winter recreation area;
- Evaluate the potential for improving traffic circulation and connections between the project site and surrounding communities;
- Evaluate the adequacy of onsite circulation routes, parking, and accessibility to support current and proposed recreational activities and facilities;

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- Analyze opportunities for improving water-based recreation and access; and
- Develop a regional approach to evaluating recreation and resource based objectives for the Delaware Lake and Alum Creek Lake project areas.

To accomplish these objectives, the Master Plan Updates will provide recommendations for modifying existing facilities and/or developing new facilities to best meet current and future requirements given project constraints. The need for possible changes in management plans for wildlife resources and habitat will also be examined. Based on conceptual layouts, potential land re-classifications required for future implementation will be identified. Maps depicting the Delaware Lake and Alum Creek Lake project areas and surrounding environs are enclosed for reference purposes.

The USACE plans to make the Draft EA available for public review in September 2010. You will be notified of the availability of the Draft EA and your comments on the EA will be requested at that time. In the interim, we request that your agency provide a list of endangered and/or threatened species and critical habitats under Federal jurisdiction that have been identified within the Delaware Lake and Alum Creek Lake project areas. We would also appreciate your identification of other significant fish, wildlife, and plant resources in areas that may be affected by these projects, any preliminary resource concerns, as well as potential issues that should be taken into account during development of the Master Plan Updates and EAs.

Thank you for your assistance in this regard. If you have any questions or require additional information, please contact me at your earliest convenience at allen_muhic@urscorp.com.

Sincerely,

A handwritten signature in cursive script that reads "Allen R. Muhic".

Allen R. Muhic, CEP
Senior Environmental Planner

Enclosures

Cc: Dan Bock, USACE, Huntington District
Tom Hunter, URS Corporation



August 6, 2010

Mr. Chris Korleski, Director
Ohio Environmental Protection Agency
P.O. Box 1049
Columbus, OH 43216

**RE: Notification of Preparation of Environmental Assessment and Request for Initial Project Review
Master Plan Updates for Alum Creek Lake and Delaware Lake
U.S. Army Corps of Engineers, Huntington District**

Dear Mr. Korleski:

The U.S. Army Corps of Engineers (USACE) Huntington District has retained URS Corporation to update the Master Plans for Alum Creek Lake and Delaware Lake near Delaware, Ohio. As part of the Master Plan Updates, programmatic Environmental Assessments (EAs) will be prepared to evaluate the potential environmental impacts from the proposed actions. The EAs are being prepared to satisfy USACE's obligations under the National Environmental Policy Act of 1969 and will also serve as a means for ensuring compliance with a variety of other Federal statutes, including, but not limited to, the Endangered Species Act, the National Historic Preservation Act, the Fish and Wildlife Coordination Act, and the Clean Water Act. The last Master Plan Update for Alum Creek Lake was prepared in 1970, while the last Master Plan Update for Delaware Lake was prepared in 1985. Maps depicting the Alum Creek Lake and Delaware Lake project areas and surrounding environs are enclosed for reference purposes.

The study objectives for the Alum Creek Lake Master Plan Update and the Delaware Lake Master Plan Update include formulation of programs and measures to accomplish the following:

- Enhance the recreational experience of park visitors;
- Minimize impacts of recreational use on project resources;
- Enhance and conserve wildlife habitat and promote conservation education;
- Identify significant and/or environmentally sensitive resources for preservation;
- Delineate and map culturally and historically important site resources;
- Develop natural resource inventories;
- Identify acceptable easement alignments through USACE property;
- Evaluate potential impacts of invasive species on project resources;
- Evaluate suitability of project lands for recreational hunting and trapping;
- Evaluate the potential for a winter recreational area;

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- Evaluate the potential for improving connections between the project area and surrounding communities;
- Evaluate the adequacy of on-site circulation, parking, and accessibility to support current and proposed recreational activities/facilities;
- Evaluate opportunities for improving water-based recreation and access; and
- Develop a regional approach for evaluating recreation and resource-based objectives for the Alum Creek Lake and Delaware Lake project areas.

To accomplish these objectives, the Master Plan Updates will provide recommendations for modifying existing facilities and/or developing new facilities to best meet current and future requirements given project constraints. Based on conceptual layouts, potential land re-classifications required for future implementation will be identified. The need for possible changes in management plans for wildlife resources and habitat will also be examined.

The USACE plans to make the Draft EAs available for public review within the next two to three months. You will be notified of the availability of the Draft EAs and your comments on the EAs will be requested at that time. In the interim, we would like to request the views of your agency and any preliminary comments on the proposed projects, including potential issues that should be taken into account during development of the Master Plan Updates and EAs.

Thank you for your assistance in this regard. If you have any questions or require additional information, please contact me at your earliest convenience at allen_muhic@urscorp.com.

Sincerely,

Allen R. Muhic, CEP
Senior Environmental Planner

Enclosure

cc: Dan Bock, USACE, Huntington District
Tom Hunter, URS Corporation



August 6, 2010

Ohio Department of Natural Resources
Building D3
2045 Morse Rd.
Columbus, OH 43229

**RE: Notification of Preparation of Environmental Assessment and Request for Initial Project Review
Master Plan Updates for Alum Creek Lake and Delaware Lake
U.S. Army Corps of Engineers, Huntington District**

To Whom It May Concern:

The U.S. Army Corps of Engineers (USACE) Huntington District has retained URS Corporation to update the Master Plans for Alum Creek Lake and Delaware Lake near Delaware, Ohio. As part of the Master Plan Updates, programmatic Environmental Assessments (EAs) will be prepared to evaluate the potential environmental impacts from the proposed actions. The EAs are being prepared to satisfy USACE's obligations under the National Environmental Policy Act of 1969 and will also serve as a means for ensuring compliance with a variety of other Federal statutes, including, but not limited to, the Endangered Species Act, the National Historic Preservation Act, the Fish and Wildlife Coordination Act, and the Clean Water Act. The last Master Plan Update for Alum Creek Lake was prepared in 1970, while the last Master Plan Update for Delaware Lake was prepared in 1985. Maps depicting the Alum Creek Lake and Delaware Lake project areas and surrounding environs are enclosed for reference purposes.

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- Evaluate potential impacts of invasive species on project resources;
- Evaluate suitability of project lands for recreational hunting and trapping;
- Evaluate the potential for a winter recreational area;

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- Evaluate the potential for improving connections between the project area and surrounding communities;
- Evaluate the adequacy of on-site circulation, parking, and accessibility to support current and proposed recreational activities/facilities;
- Evaluate opportunities for improving water-based recreation and access; and
- Develop a regional approach for evaluating recreation and resource-based objectives for the Alum Creek Lake and Delaware Lake project areas.

To accomplish these objectives, the Master Plan Updates will provide recommendations for modifying existing facilities and/or developing new facilities to best meet current and future requirements given project constraints. Based on conceptual layouts, potential land re-classifications required for future implementation will be identified. The need for possible changes in management plans for wildlife resources and habitat will also be examined.

The USACE plans to make the Draft EAs available for public review within the next two to three months. You will be notified of the availability of the Draft EAs and your comments on the EAs will be requested at that time. In the interim, we would like to request the views of your agency and any preliminary comments on the proposed projects, including potential issues that should be taken into account during development of the Master Plan Updates and EAs.

Thank you for your assistance in this regard. If you have any questions or require additional information, please contact me at your earliest convenience at allen_muhic@urscorp.com.

Sincerely,

Allen R. Muhic, CFP
Senior Environmental Planner

Enclosure

cc: Dan Bock, USACE, Huntington District
Tom Hunter, URS Corporation

Appendix C:
Document Distribution
and
Notification of Availability of Draft Alum Creek Lake
Programmatic Environmental Assessment

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Project:	Notice of Availability of Draft PEA and MPU Legal Advertised in following Newspapers :	
Alum and Delaware Combined	Regional market – August 30, 2011 <i>Columbus Dispatch</i>	Local market – August 31, September 7,14,21, 2011 <i>Delaware Gazette</i>
Project:	Documents distributed for comment to:	
Alum Creek Lake	USACE Alum Creek Lake Project Office Bob Wattenschaidt 5905 Lewis Center Road Lewis Center, OH 43035-9215 740-548-6151	The Columbus Metropolitan Library 96 S. Grant Ave. Columbus, OH 43215 (614) 645-2275
Delaware Lake	USACE Delaware Lake Project Office Ben Odell 5202 US 23 North Delaware, OH 43015 740-336-4011	Delaware County Library 84 East Winter Street Delaware, OH 43015-1959 (740) 362-3861
Project:	Notification of Availability letter to be sent to:	
Alum and Delaware Combined	Ohio Department of Natural Resources Building D3 2045 Morse Road Columbus, OH 43229	Ohio Department of Natural Resources Victor Ricks 3615 South Old State Road Delaware, OH 43015 740-548-4631
	Ohio Environmental Protection Agency Mr. Chris Korleski, Director P. O. Box 1049 Columbus, OH	U. S. Fish and Wildlife Service Ohio Ecological Services Field Office Dr. Mary Knapp, Field Supervisor 4625 Morse Road, Suite 104 Columbus, OH 43230
	Delaware County Regional Planning Commission Scott B. Sanders, Executive Director 109 North Sandusky Delaware, OH 43015	Delaware County Engineer Brett R. Bergefurd 50 Channing Street Delaware, OH 43015

Text of the legal advertisement:

Notice of Availability

The U.S. Army Corps of Engineers, Huntington District, has prepared **Master Plan Updates and Draft Programmatic Environmental Assessments** for **Alum Creek Lake** and **Delaware Lake Projects**.

Master Plans are used by the Corps to address issues such as outgrants, public use, and appropriate use of Project lands. The Master Plan Updates include recommendations for improvements to support the authorized Project purposes. Programmatic Environmental Assessments provide a broad evaluation of potential environmental consequences of proposed Project improvements.

The documents will be available August 31, 2011 for public review at:

- USACE Project Offices at Alum Creek Lake and Delaware Lake,
- The Columbus Metropolitan Library,
- The Delaware County Library,
- Website: <http://www.lrh.usace.army.mil/projects/review/>.

Comments pertaining to the documents will be accepted until September 30, 2011.

Comments may be submitted on the website above,

by e-mail to: LRHPublicComments@usace.army.mil;

or by letter to: Mr. Jonathan J. Aya-ay, Chief Environmental Analysis Section,
Planning Branch Huntington District Corps of Engineers
502 Eighth Street
Huntington, West Virginia 25701-2070